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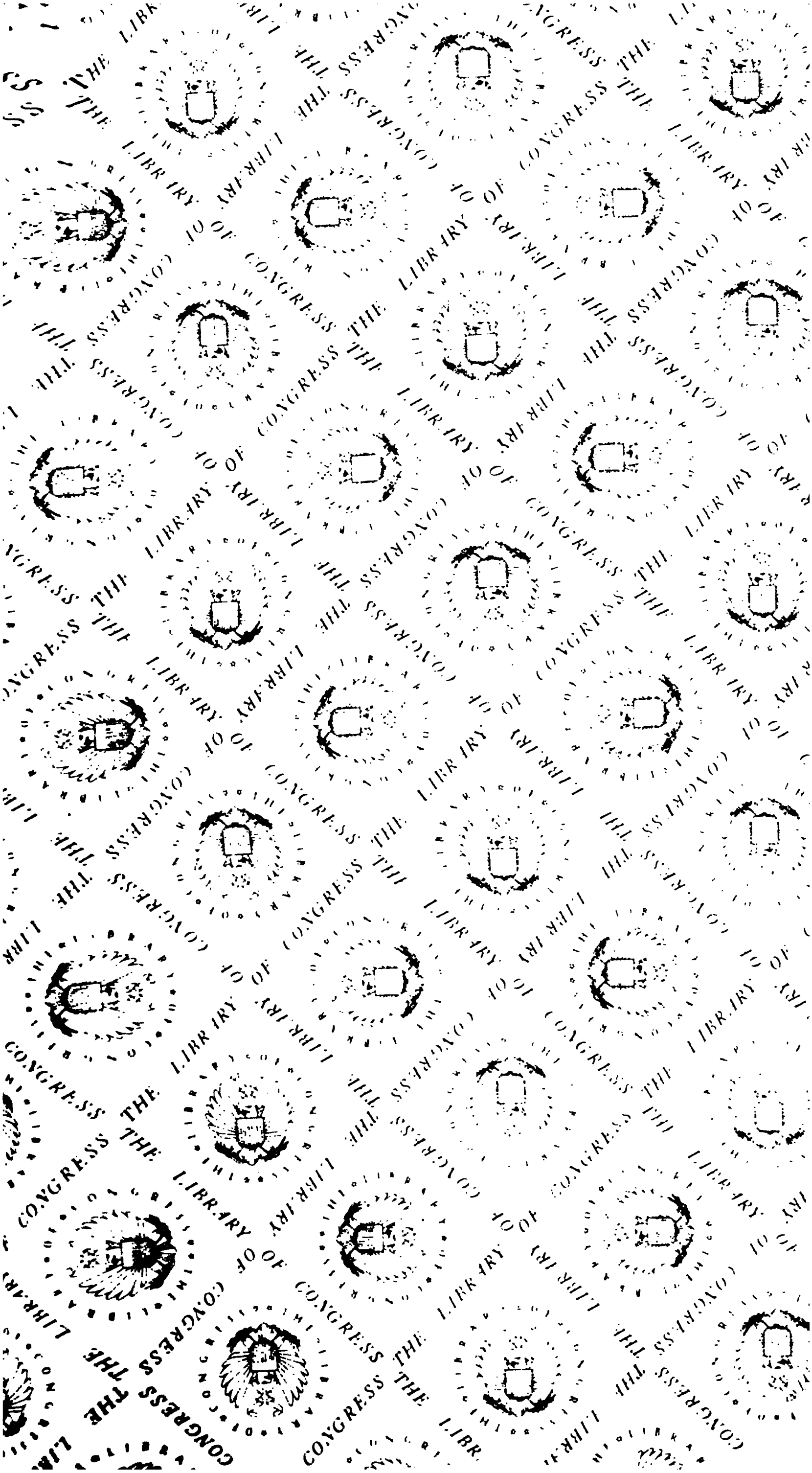

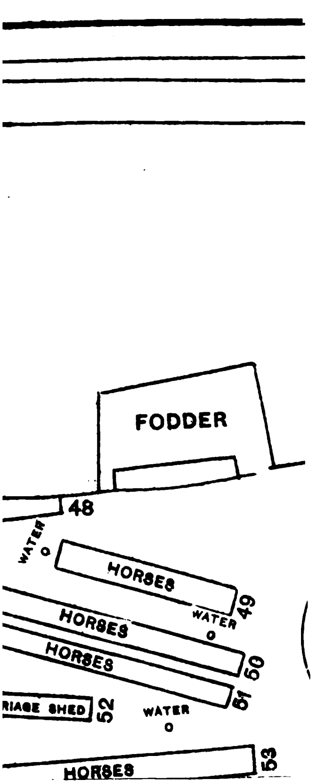
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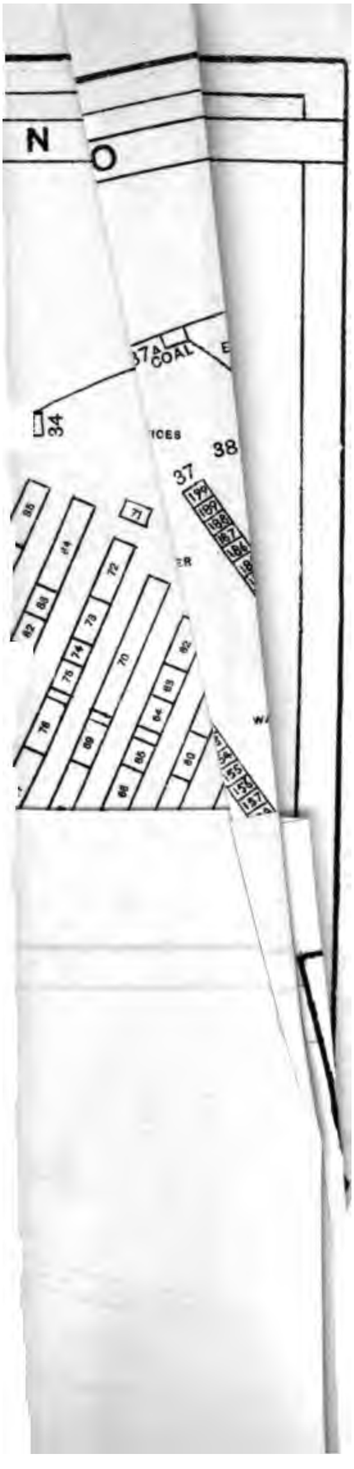
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JOURNAL

OF THE

AND WEST AND SOUTHERN COUNTIES SOCIETY.

FOURTH SERIES.

VOL. VIII.

1897–98.

WORK AND LEARN.

LONDON:
RD STANFORD, 26 & 27, COCKSPUR STREET,
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1898.

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"He that goes about to forward agricultural improvement must begin by finding out the true reasons of what is called routine, or the 'custom of the country.' It sometimes happens that these reasons are only accidental, and then you may dismiss them fearlessly; but often it turns out that every-day practice rests on a solid foundation of facts; and then if you make an onslaught on local prejudices, they will be sure to beat you.

"The true course for the agricultural improver is, to take one step at a time, to gain a clear insight into facts by experience, not to try to go too fast, and to trust to the work of time.

"If practice which sets up to do without theory is contemptible, theory without practice is foolhardy and perfectly useless."—*From the Rural Economy of England, Scotland, and Ireland,* by Léonce de Lavergne.

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JOURNAL

OF THE

BATH AND WEST AND SOUTHERN COUNTIES SOCIETY.

Original Articles.

I. — *Bovine Tuberculosis and its Suppression.* By JAMES WILSON, M.A., B.Sc., Fordyce Lecturer in Agriculture, Aberdeen University.

TUBERCULOSIS is in the peculiar position of being a disease concerning which a vast amount of knowledge has been collected, but which is yet surrounded in the public mind with so strong a fortification of time-honoured but erroneous opinions that it seems safe from serious attack for some considerable time to come. Notwithstanding that to it is assigned about one-eighth of our annual British death-rate,* and that by it about a fifth of our cattle are attacked, we continue in familiar confidence like alpine villagers beneath continually threatening destruction. Were we threatened with plague or rinderpest we should immediately take alarm and spend ourselves and our wealth to keep them off; but this much more serious disease, which we have already with us, and which we could undoubtedly reduce, is comparatively neglected. To some extent the sudden and alarming nature of plague or rinderpest, and the slow and insidious nature of tuberculosis, will account for our energy or our apathy. Plague is upon us in a moment, but not without warning to most; while tuberculosis may have any of us in its power long ere its grip is suspected.

CAUSE AND NATURE OF TUBERCULOSIS.

Before going further with this article, the chief purpose of which is to suggest what might be done towards suppressing bovine tuberculosis, it is necessary to discuss, as shortly as possible, those points which are fundamental to any suggestions that may be made; and, with regard to the cause of the disease, we cannot do better than quote the words of Professor Nocard:—"Like all infectious diseases, tuberculosis only acknowledges one cause, namely, the penetration into the system, and the propagation therein, of the specific agent, the bacillus of Koch." *

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* Professor Nocard has written :—" Tuberculosis goes on increasing its ravages : at the present time, of every 100 Parisians who die, twenty-three—about a quarter—die of tuberculosis, and among the seventy-seven who die of some other disease, how many have tubercular lesions? "

The fact that tuberculosis is an infectious disease due to a specific cause is the real starting point for its suppression; for, if it were not an infectious but a hereditary disease, then our hopes of ultimate victory, considering how many of our cattle are affected, would be but small indeed, and the revelations of tuberculin, by far the most powerful diagnostic yet discovered, would only help to make the end seem farther off than ever. The old belief that tuberculosis is hereditary—in the sense of being handed on from sire or dam to progeny—is still held by some veterinarians and by a large proportion of our stock breeders and stock owners, but this belief has declined among medical men, and it will also undoubtedly decline among veterinarians and stock-owners. This old belief in heredity, modified to the extent that tubercular ancestors hand on to their descendants a hereditary tendency to acquire the disease, is now more widely supported, and, later on in this article, it will be somewhat closely examined.

Next to the recognition of tuberculosis as an infectious disease, the point of most importance is that, before an animal can be affected, the bacillus of Koch must not only "penetrate into" but must also "propagate within" the system. In good hospitals for human consumptives there is now no extraordinary amount of tuberculosis among the nurses and doctors, yet no one can imagine that their systems are not penetrated by the tubercle bacillus. Those nurses and doctors escape the disease through exceeding care being taken against the fulfilment of the second condition—the propagation—necessary for its acquirement: the healths of those whom duty exposes to the infection are maintained as near perfection as knowledge can maintain them, and any sign of sickness or ill-health is a signal for the removal of the doctor or nurse from the presence of danger. The principle determining such precautions holds good for all infectious diseases, and is applicable to human beings as well as to animals. It may be stated, shortly, that living animal tissues have the power of resisting microbe attacks so long as those tissues are healthy and the microbes not present in overpowering numbers. This principle explains why doctors

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* 'The Animal Tuberculoses and their Relation to Human Tuberculosis,' translated by Dr. H. Scurfield.

nd nurses escape an epidemic until they are worn down by verwork, and why a man may drink a thimbleful of an infected luid but not a tumblerful.

There are two main gateways—the mouth and the nostrils—y which the tubercle bacillus may penetrate an animal's ystem; but occasionally it is found to penetrate by a skin wound. We rarely hear of a newly born animal[*] being tuberculous. It has been stated that a tuberculous male may infect a non-tuberculous female and that a tuberculous female may also infect a non-tuberculous male. It must be remembered, as stated in the quotation from Nocard, that tuberculosis will not be brought about by mere *penetration* alone, but only by *propagation* of the bacillus within the system, in addition. When propagation takes place, then we find bacteria passing more or less slowly from the points of first infection to other points which in their turn become new centres of dissemination to pass on bacteria to still newer centres, and so on, till the animal is slaughtered or dies or makes a real—although this is doubtful—or apparent recovery. The speed of propagation of the bacteria is dependent upon their number and upon the resistance which the tissues of the animal are able to offer. Thus the disease may be expected to advance slowly in its earlier and more quickly in its later stages, while its advance may be arrested more or less at times when the animal may happen to be in more or less vigorous health. And thus also recovery, if it be possible at all, will be less probable in the later stages of the disease than in the earlier. In addition to the lungs and intestines, the other parts of the body chiefly attacked are the glands (of which the udder is one) and the organs (the liver and kidneys for instance). The injurious nature of the disease lies in this, that the bacteria of tubercle, like all other living things, must have food: which, in their case, is extracted from the tissues of the living animal. They also, like other living things, do not totally consume the food before them and turn it all into bacterial tissue—so to speak—but are the cause of a considerable amount of waste and excretory matter: this we find in the pus that accompanies tubercular lesions. Hence, the tissues of an animal which is suffering from tuberculosis are gradually devoured and destroyed by bacteria; and not only so, but tissues that are not yet attacked may be seriously impeded in their functions by the excretory accumulations as also by other poisonous matters developed by the bacteria. It may be that parts of a tubercular lung are temporarily relieved when some of this bacterial xcretory matter is expelled by a cough; but, unfortunat his relief to an unhealthy animal is a serious source of dar o the healthy.

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[*] Tubercular abortions may, however, be not uncommon.

HOW TUBERCULOSIS IS SPREAD AMONG CATTLE.

If the bacteria propagated within the tissues of an ani vere to remain enclosed within that animal's body, there w e no great danger to other animals; but the unfortunate t s that affected animals in certain states become centre langer to their whole neighbourhood. While an anima live, bacteria or their spores—which may be looked u vithout seriously stretching botanical accuracy, as the seed he bacteria—may pass to the outside from any diseased o hat is in communication with the open air: they may pass f he lungs by a cough, they may pass from the intestines in xcreta, they may pass from the udder in the milk, and i onceivable that they—the spores at any rate, if there be —may be found alive in the urine. If the matter expelled f he lungs or the intestines is allowed to lie on the walls or f a cowshed until it becomes perfectly dry, then every t f a broom, every swish of a tail, every rub of a piece of clot ind every breath or current of air will raise waves of bact dust to thicken and vitiate the atmosphere. As time goe there will be deposited on walls, ledges, crevices, and rafters, l upon layer of infectious matter till some atmospheric or c disturbance sets it again in motion. An occasional spray a weak solution of carbolic acid would go far towards killing infectious matter and would thus lessen the risk to sound c when living within the same walls as the unsound. The ud of the cow is not often the seat of tuberculosis, and only a s proportion of tuberculous cows have been shown to give containing tubercle bacilli; yet, where the milk of a l cows is mixed together, tubercular milk from only one ma enough to make the whole virulent. As, unfortunately, mil in this country—in most countries in fact—often takes pla an atmosphere laden with tubercular dust, need we wonder milk not only for young children but for young cattle has to be looked upon with the very gravest suspicion? tubercular animal in a byre is a danger to all the others, double the danger, three treble it, and, as the tissues of

---

* Bang estimates that at Copenhagen under 3 per cent. of the tuber cows have tubercular udder [Nocard's 'Animal Tuberculoses,' p. 96], Nocard's estimate is under 4 or 5 per cent. ['Archiv für Thierheilkunde. p. 219]. Among 17,202 cows and heifers of all ages slaughtered at L public slaughter-house between June, 1893, and February, 1895, Dr. Lun found 119 with tubercular udder ['Archiv für Thierheilkunde' for 1897, p.

iving milk, especially when tied up by the head for long eriods, are less likely than the tissues of fattening or other attle to be in condition to resist infection, need we wonder hat so many dairy cows in this and other countries are tuberulous? Nor should it surprise us to find more tuberculosis mong heifers and bullocks wintered under the same roof s dairy cows than among the same kind of stock when wintered by themselves. Still further: since, among a lot of uckled calves, only those having access to a tubercular udder un risk of being infected through the milk, while, among a lot f calves hand-fed upon mixed milk, a single tubercular udder may be a source of danger to many, we need not be astonished o find tuberculosis more common among animals brought up by hand than among animals brought up by their mothers.

HOW CATTLE MAY INFECT HUMAN BEINGS.

If we in this country are to attempt to suppress bovine tuberculosis, the impulse will probably come from one of two or rom both considerations—considerations concerning the public health or the pocket. Undoubtedly, a large proportion of human tuberculosis is acquired from human beings already affected, but there are reasons for suspecting—to put it no stronger—that a considerable proportion is acquired from tuberculous cattle. From cattle—leaving aside the infection of farmers and cattlemen in infected cowsheds—there are two sources of infection to human beings, namely, the flesh and the milk; but of these it is the milk we have most to fear, since flesh is cooked before being eaten, while milk is largely taken in the raw condition. Those who have anything to fear from tuberculous flesh are they who have to handle it in the raw condition—the butcher and the cook; but regarding the dangers of tubercular milk, we can seldom take up a paper or a volume dealing with public health without being warned against the use of milk in the uncooked condition. Perhaps the following quotations from the 'Report for 1892 of the Medical Officer of Health for Aberdeenshire' may be more telling than the reported opinions of the chief authorities in Europe:—

"At the Great Ormonde Street Hospital for Sick Children in London, in 1877, of seventy-six who died, over a third died from the various forms of tuberculosis.

"In the General Hospital for Sick Children, Manchester, in 1881, 27 per cent. died from tuberculosis.

"In the Hospital for Sick Children in Glasgow, in 1889, 45 per cent. died from tubercular disease.

"In the case of children, the ordinary point of attack—viz.

the intestinal glands—indicates, in a significant manner, the frequent source of infection."

It might be argued that this "frequent source of infection" is the mother's and not the cow's milk; but this argument will not hold, for the reason that tubercular disease of the human mammary gland is about as infrequent, if not more so, than in the case of the cow.* And even if this were not so, how long would a child be allowed a tubercular breast? Still further, if the case of young children be at all analogous with that of young cattle, the child is very seldom affected by the mother while at the breast, and, if affected at all, is more probably affected in the lungs than in the intestines.

THE DETECTION OF TUBERCULOSIS.

Until within recent years there was no thought of attempting to diminish tuberculosis among cattle, for the reason that its enormous prevalence was not suspected. Piners there were and cows that would not fatten as many as now; but they were looked upon as inevitable, though not very much of an evil, till the public health officer began to interfere with the butcher and the butcher to pass his losses on to the farmer. But even then the farmer was ignorant of the true state of affairs, and if he had not been so he was almost completely helpless, through there being no means of detecting the disease in its earlier stages. Doubtless, the isolation of animals found to be tuberculous by the old methods of diagnosis would, in the course of long years, have tended to a diminution of the disease, for it is probable that an animal far gone in consumption is more dangerous to its fellows than another not yet apparently attacked; but, unfortunately, there were few to see that such a course was very desirable and still fewer to put it in operation. Now, however, we have a most delicate diagnostic in tuberculin which, although it has brought about most unpleasant and alarming revelations as to the prevalence of the disease, gives promise of being the means of its final eradication. It is sometimes argued against tuberculin that it is not a perfect diagnostic. A man in one part of the country finds an animal react to the test, but is unable to find any signs of tuberculosis when the animal is examined post-mortem; another in some other part of

---

* Under the heading "Mastitis" in Professor Hamilton's 'Text-Book of Pathology,' vol. ii. p. 794, we read:—"Inflammation of the breast often ensues upon injury or lactation. In the latter case it tends to terminate in suppuration. and the abscess is situated sometimes in the embedding connective tissue; at other times it also involves the gland structures. The abscess may open and leave a fistula. Occasionally these fistulæ arise from a tubercular source, or they may become tubercular from exposure."

try gets no reaction to the test, while, on post-mortem
ion, the animal is found to be tuberculous. Therefore,
the test is untrustworthy! No doubt the first-named
nined every tissue of his animal with the microscope,
loubt the other performed the testing operation with
nsideration necessary regarding the animal's condition
infallible accuracy! But what say Bang, of Copenhagen,
ard, of Paris, perhaps the two men with the widest
n experience, regarding the accuracy of tuberculin?
Bang* has estimated that it will diagnose correctly
x times out of a hundred, while Professor Nocard, who
deny that some few tuberculous animals will not react
culin, asserts that no other disease will give the cha-
c reaction of tuberculosis to tuberculin.† And what
an this do we want? Are we to put aside this new
ic with an inaccuracy of perhaps 4 per cent. and revert
iagnostic of not so very long ago with an inaccuracy
er cent. or even more? It is also objected to tuber-
at a dishonest person can inject successive doses of
in into a tuberculous animal until it will give no
at all, and then sell it as sound according to the test.
man to starve himself because, by eating, he may live
aken advantage of by an occasional sharper?

THE PREVALENCE OF THE DISEASE.

the discovery of tuberculin the only data we had
g the prevalence of tuberculosis in this country were
quired from the post-mortem examination of the 10,269
aughtered for pleuro-pneumonia in 1891, which indicated
tish cattle were affected to the extent of 12½ per
But it is to be expected, from the greater accuracy of
in in comparison with post-mortem examination, even
bercle is specially looked for, that this 12½ per cent.
e to be raised considerably. Unfortunately, however,
sh authority seems yet to have found the opportune
for publishing his estimate. We hear whisperings of
per cent. for all ages of British cattle and of over 40
. for cows and heifers in-calf or in-milk, but no one
illing to make himself heard. Yet, by comparison with

Hygienic Conference at Budapesth.
iticism of Nocard's 'Die Tuberkulose beim Rinde und das Tuberkulin,'
für Thierheilkunde' for 1897, p. 221.
2, 3,611 cattle were slaughtered for pleuro-pneumonia, and of these
per cent.—were tuberculous by post-mortem examination. Those
re, however, chiefly milk cows from cowsheds in London and

complete results published in Denmark—the only country t as yet seems to be in earnest in the matter—we find those w perings not so very wide of the mark. For instance, in slaughter-houses at Copenhagen, where meat inspectior reported to be very carefully conducted, in 1893 over 17 cent. were found to be tuberculous, while of 45,000 cattle te with tuberculin, in 1894–95, no less than 19,000, or about 40 cent., were found to be affected.* Now, we can state a ques in simple proportion: if 17 per cent. by post-mortem give per cent. by tuberculin, how much will 12·5 per cent. gi And the ratios might be placed together in the usual way:—

17 : 12·5 : : 40 : 29·4

Again, Professor Bang has reported from 53,303 Danish res the numbers and percentages of cattle affected at different ag and a glance at his figures, which are given in the follow table, will help to make the estimate of 40 per cent. for Bri cows and heifers in-calf or milk seem not so very unreasona

—	Healthy.	Re-acting.	Percentage Healthy.	Percen Re-act
Catttle under six months ..	6,449	1,181	84·5	15·
„ „ one year ..	7,988	3,325	70·6	29·
„ „ two years ..	5,310	3,611	59·5	40·
Grown cattle	12,891	12,548	50·7	49·

The last percentage (49·3) is not so much over the Bri estimate for cows as Professor Bang's other percentages are the British estimates for other cattle; but it has to be rem bered that the 49·3 per cent. contains results for bulls bullocks as well as for cows and heifers. In Denmark, since all ages of cattle are kept under the same roof, we sh expect more tuberculosis among young cattle than in Engla

THE FARMER'S LOSS.

The great prevalence of tuberculosis among British cattle source of considerable annual loss to the British stock-ow In the United Kingdom there are, in round numbers, 11,000 cattle made up as follows:—cows and heifers in-milk or in

---

* 'Archiv für Thierheilkunde' for 1897, p. 219. Professor Bang's re collected from all Denmark up to October, 1895, gave 38·7 per cent. tuberc out of 53,303 tested.

† 'Deutschen Zeitschrift für Thiermedicin und Vergleichende Pathol vol. xxii.; also Hatch (U.S.), Experiment Station, Bulletin No. 41, Au 1896.

4,000,000; and other cattle, over two years, 2,500,000, over one but under two years, 2,250,000, under one year, 2,250,000. Assuming the estimates already quoted as to the prevalence of the disease to be correct, there are 2,200,000 tuberculous cattle in Great Britain, of which number 1,600,000 are calving or milking cows and heifers. If we assume that the average time for cows to give milk is between three and four years, then the number of cows discarded annually is about 900,000, of which, since the longer a cow is kept the greater are her chances of being unsound, perhaps about 450,000 are tuberculous. But those 450,000 cows do not all go to the butcher at full value: of those that are in a more or less wasted condition when discarded, some are slaughtered and buried at home, some go to the knackery, and others are bought for trifling sums either at home or in the market by dealers in precarious meat. Are we high enough when we estimate that 10 per cent. of the discarded tuberculous cows are disposed of in this way? And, if we assume that the average price of discarded healthy cows is 15*l.*, and that the average return for those wasted 45,000 is 3*l.*, we have on this head an annual loss to the stock-owner of 540,000*l.*

Nor do the other 405,000 tuberculous cows go to the butcher at their healthy value. The butcher now knows that, with cows especially, he undertakes whatever risks arise from more or less efficient meat inspection, and against this he has to insure himself at the time of purchase. Are we beyond the mark in estimating that not only these 405,000 tuberculous cows, but also the 450,000 sound cows would fetch other twenty shillings a-piece if the butcher were sure of their carcases being fit for human consumption? On this second head we have a loss of 855,000*l.* to the stock-owner.

Nor is this all: one of the results of ill-health with the cow is a diminution in the quantity and a deterioration in the quality of her milk. This is seen not only in the dairyman's pail, but also in the ill-thriven calves of the stock-raiser who has them brought up by their tuberculous mothers in Nature's own way. And of the 1,600,000 tuberculous cows, would it be too much to assume that a fifth of them, which is slightly more than half the number of tuberculous cows annually discarded, are giving an impaired return either to the dairyman or the stock-raiser? Indeed, is not an impaired return the usual cause of a cow being discarded, and are not healthy cows at their best about the fifth or sixth year of lactation? And, while some cows are giving a highly impaired return, although the return of others is only slightly affected, would the estimate be too high that on the average the return of the 300,000 cows is affected to the extent of one quarter? Then, if we assume that the average annual return from cows in this country is 12*l*., we are met with a loss on this head of 900,000*l*.

Nor is this yet all: there is another loss that is felt perhaps but slightly in the case of dairy cows, but which is felt in the case of suckling cows above the average value and in the case of cows retained for pedigree breeding. The cause of this loss lies in the fact that tuberculosis, in many cases, affects the reproductive organs of the female with the result that the animal produces an abortion or becomes an uncertain or even a non-breeder.* How often at a stock-breeding farm do we find animals that are not in-calf but are kept on, merely eating their meat, for months and even occasionally for years, in the hope that they may yet be fortunate enough to produce a calf! And how often, at sales, do we see cows that are declared to be uncertain breeders, and others again that have been mated just a few weeks previously! The number of cows in this condition may not be so very many, but then the cost of their keep is a matter of some moment. Suppose we say that one in thirty of all tuberculous cows are affected in this way and that the average time lost by each is three or four months—remembering that this trouble is more serious among suckling cows than among dairy cows, and that the "in-calf" cows that are not in-calf passing from one man to another help to swell the average loss in time—then we have 53,000 cows—reckoning their average annual cost at from eight to ten pounds—causing an annual loss of 150,000*l*.

Our computations so far amount to 2,445,000*l*., which is all incurred through cows alone; but we have yet to add to this the loss expected from other cattle. Since, however, other cattle are affected, perhaps only to a fifth or a fourth the extent that cows are—20 per cent. of all cattle affected and 40 per cent. of cows leaves about 8½ per cent. of cattle other than cows affected—since also they are usually sent to the butcher before their condition is nearly so bad as that of cows; and since the losses on their account are incurred only through impaired feeding and an occasional death or seizure at the hands of the

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* "Tuberculosis even on its first appearance is, much more often than we imagine, the only cause of that abortion which in an infected herd (*dans l'exploitation infectée*) occurs again and again even to the extent of making us believe it is epizootic abortion; often the tuberculous cows become bullers (*taurelières*), and are of no further use for reproduction." Professor Nocard in 'Annales de la Science Agronomiques' for 1896, p. 142. At Leipzig slaughter-house, from August, 1894, to March, 1895, among 267 cows and heifers having peritoneal or general tuberculosis, Dr. Lungwitz found 155 (58 per cent.) with tuberculosis of the uterus. 57·9 per cent. of those having only peritoneal tuberculosis were found to be so affected. Even animals that had never been impregnated were so affected. 'Archiv für Thierheilkunde' for 1897, pp. 53–54.

alth officers—perhaps also through the butcher insuring
t time of purchase—the sum to be added to our two-
f millions must be proportionately smaller. Our loss
s and calving heifers works out at about twelve and
a head. If we say that our losses upon all other cattle
a tenth as much per head, then they amount to

um total is now 2,882,500*l.* But to this have to be
ose losses that can scarcely be estimated, from derange-
the stock-keeper's business, from forced sales, and,
from purchases at unfavourable times, from unex-
xpenses, from litigation, and so on. We are probably
beyond the mark if we reckon the total annual loss
le alone to the British farmer and stock-owner at
l.

HEREDITARY PREDISPOSITION.

the last of the "theoretical" stumbling-blocks to
n the speedy elimination of bovine tuberculosis is the
hereditary predisposition: namely, that tuberculous
transmit to their descendants a predisposition to con-
disease. If this theory be true, and if, at the same
editary predisposition be a potent factor, then we may
give up the attempt to improve the condition of
e; for, the weeding out of those animals who could
ck even a quarter of a century in their pedigrees and
they were free from tuberculosis would interfere with
90 per cent.—if not more—of the cattle now on the
s of Great Britain and Ireland. But what is this
y predisposition? Granting that there is such a thing,
it? If we turn to man, we find him subject to a
of infectious diseases, in addition to tuberculosis—to
ever, typhoid fever, small-pox, cholera, and so on. No
inherited from his ancestors the disposition to contract
eases; but is he ever afflicted with any one of them if
ot infected? And, so far as we can see, while other
s are the same, are the descendants of those who have
diseases attacked in appreciable numbers, while the
nts of those not known to have had them are exempt?
for instance, of diseases being introduced into new
and islands—Asiatic cholera,* measles in the South

Asiatic cholera, at p. 544, vol. ii. of Professor Hamilton's 'Text-Book
y,' we read:—"It was not, however, until the present century that
take on a tendency to travel. Previously it remained indigenous in
es where it was engendered, and chiefly in India. In the beginning
ury, probably with the advent of increased commercial facilities, it

Seas, tubercle in some of the Western Islands—but do we ever hear of the original inhabitants remaining free from attack while only the introducers and their descendants are the sufferers? By a similar method we might reason with regard to cattle, and we might cite such diseases as rinderpest, pleuro-pneumonia, and foot-and-mouth disease; but need we go any farther? Supposing it were possible, in this or any other country, to set on one side the animals that were fortunate enough to have no tuberculous ancestors, could we then say that the one class of animals would be less subject to tuberculosis than the other? It is conceivable that, through a long period of selection, a breed of cattle might be evolved which would be immune against, say, pleuro-pneumonia; but, so far as we know, no such breed is as yet in existence. It is also conceivable, although the difficulties would be infinitely greater, that, in the same way, a breed of cattle might be evolved which might be immune against tuberculosis; but, unfortunately, none of our prehistoric ancestors thought it worth his while to make a beginning.

There is still another modified phase of this hereditary predisposition theory which holds that, when tuberculosis is so near an individual as to have been affecting that individual's mother or father, or even grandparents, then the individual is predisposed to the disease. But is this because the parents or grandparents were tubercular? Is it not rather—allowing it to happen occasionally—because of the weakened condition of the parents that the progeny are weaker to withstand infection? And may not this condition be brought about by other causes? What about ventilation, starvation, hunger, and all other forms of disease? In the sense that has been indicated, hereditary predisposition cannot be denied, but its significance in settling which is and which is not to be attacked is infinitesimally small. The real danger in tuberculosis is not from an animal's ancestors, as ancestors, but from its neighbours, from the animals with which it is in contact, especially during confinement, from infected food and buildings, and from any cause whatsoever which deteriorates its own physical condition.

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began to spread periodically into foreign lands, and to overrun ultimately the whole of Europe and a great part of America. It is questioned whether before this time the disease was even known in Europe, the descriptions given by Hippocrates, Galen, Celsus and others appearing to refer to what we now designate as *cholera nostras*, not to true Asiatic cholera. There is one significant point about true cholera, namely, that wherever it occurs, and whatever people it affects, it induces the same line of symptoms, and is accompanied by the same fatal consequences. Hence had there been any great prevalence of the disease in Europe in bygone times, we would certainly have had some record of it handed down to us. Nothing of the kind, however, is to be met with until the year 1817, the memorable year in which the disease became pandemic."

REPORTED ATTEMPTS TO DIMINISH TUBERCULOSIS.

Of reported systematic attempts to eradicate tuberculosis ly two will be referred to, for the reasons that the principles hind them are the same and are the principles that must behind every attempt; that those two attempts have been sucssful; and that they are familiar to the writer. The attempts be referred to are Professor Bang's at Thürebylille, near Copengen, and Sir Thomas Gibson-Carmichael's at Castle Craig, in eblesshire. A point to be taken into account in connection th this question is that the eradication of tuberculosis is not be accomplished by heroic or suddenly drastic methods. We nnot afford to slaughter either a fifth of our cattle or two-fifths our cows, and the slaughter of all animals at an affected m, as in pleuro-pneumonia or swine fever, is altogether out the question. Because of the great prevalence of the disease, eradication must be gradual; and, with this consideration view, the attempts at Thürebylille and Castle Craig are rtinent and valuable.

The only differences of importance between Thürebylille d Castle Craig are that the Thürebylille herd is a dairy rd while the Castle Craig herd is a pedigree breeding herd ere the calves are suckled by their mothers; and that the ürebylille herd is all housed under one roof while the Castle aig herd has been housed under several.

At Thürebylille,* in the spring of 1892, the whole herd was ted with tuberculin, and immediately thereafter those found be tubercular were stalled in one end of the byre, while the nd animals were stalled or boxed in the other. As soon possible a readily movable partition of building paper and ards was run up across the centre of the byre to separate the e set of animals from the other. Since the beginning of e experiment, each set of animals has been looked after only its own attendants who take the still further precaution of ing different implements in the two divisions. After the st testing the entire byre was carefully disinfected: which eration has since been repeated every spring. At the first sting the reacting calves—since the first testing these have en scarce—were immediately slaughtered; all the others d all calves born and reared since then have been fed upon iled milk. Reacting cows which showed noticeable clinical idence of tuberculosis were immediately slaughtered. In mmer the cattle in the two divisions have been pastured me distance apart. Further than this, nothing has been done: the routine of things has been as before: what animals have been required to fill up gaps have been re on the farm just as before; bulls and cows and other ani have been disposed of as they would have been had there no testing. Down to October, 1895—the latest report in writer's possession—the results* are as follows:—

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* Hatch Experiment Station, Bulletin No. 41, August, 1896, or, 'Deutschen itschrift für Thiermedicin und vergleichende Pathologie,' vol. xxii.

Date.	Total Stock.	Unsound.	Sound.	Percentage Unsound.	Percen Soun
April, 1892	208	131	77	63	37
October, 1892	..	..	77	..	..
May, 1893	212	90	103	42·5	47·
October, 1893	..	..	107	..	..
April, 1894	203	81	122	40	60
October, 1894	..	..	119	..	..
May, 1895	205	69	136	33·5	66·
October, 1895	..	..	132	..	..

A small portion of Professor Bang's article may here quoted with profit:—

"The first year's result was thus unfavourable, for al 10 per cent. of the animals of the healthy division reacted the repeating of the test. This may be due partly to of care in making the division the first year. [At the division of a tuberculous herd it must always be borne mind that single animals may have acquired germs so sho before the test that they are not yet in condition to show infection by a reaction—Footnote.] But I believe the cause was unfavourable local conditions. In order to e the healthy division it was necessary to go over a walk which the dung of the reacting division was carried out. the time this walk was very poorly paved, and therefore to clean. Infected particles could therefore very easily att themselves to the foot-gear of passing persons, and thus be in duced into the healthy division. This walk was later radic improved. Since October, 1893, a result has been obtai which left nothing to be desired, when the local conditi are considered. I wish to call especial attention to the that, with the exception of two cases of inborn† tubercul and the one doubtful case at the last test, thus far no ani born in the reacting division since the beginning of the exp ment has later shown itself to be tuberculous. The pract bility of the method is hereby proven." ["The mothers hese animals and the fathers of most of them had tuberulosis"—Footnote regarding "*animals born in the reacting ivision.*"]

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* Hatch Experiment Station, Bulletin No. 41.

† This quotation is all from the American translation. "Inborn" may represent with exactness the author's meaning.

At Castle Craig, in March, 1895, two years later than the ommencement of the Thürebylille experiment, which was as et unknown at Castle Craig, all the animals intended to be hen bred from and several yearling heifers were tested with uberculin; and as soon as possible thereafter the unsound were eparated from the sound. Two unsound yearling heifers and cow that could be seen to be badly diseased were slaughtered; but, after some consideration, all the other unsound animals—hey were all females—were kept on to be disposed of as they would have been had there been no testing: as a matter of fact they have been kept on till they became "uncertain" breeders. In the following summer and annually since then the byres have been disinfected with a 5 per cent. hot solution of arbolic acid.

At Castle Craig the calves are mostly born between December and March, and they are allowed to run with and be suckled by their mothers until the following autumn. The only precaution taken to prevent the calves from being infected by their mothers during this time is that, when the weather allows, mothers and calves are sent out to the field daily, and while they are out the doors and windows of their byre or boxes are left open. The cows are examined occasionally for tubercular udder. During the remainder of the spring of 1895 the sound and the unsound were housed in separate byres at the same farms, but since then they have been housed at different homesteads. Thus, the method is very much the same as that adopted at Thürebylille, with the exception that the calves are fed by their mothers instead of being fed upon boiled milk. The results at Castle Craig are the same as at Thürebylille, with the exception that not a single tuberculous animal has been reared at Castle Craig since the testing was begun.*

"Since the first testing, in the winter of 1894–95, the herd has been allowed to increase or decrease in the ordinary way: to increase by the annual crop of calves, and to decrease by sales to the butcher, by sales of breeding animals, and by the slaughter of all tuberculous animals that have become unfit for breeding. The only alteration in the management of the herd has been the annual testing and the separating of the unsound and the sound. In March, 1895, forty-one animals out of about eighty were tested, and sixteen—about 20 per cent. of the whole—were tuberculous. In January, 1896, the herd o eighty-six animals was tested, and ten—11·63 per cent.—wer tuberculous; in November, 1896, eighty-three animals wer tested, and nine—10·84 per cent.—were tuberculous. And th spread of the disease has been completely arrested." *

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* Since the above was written, at the fourth testing at Castle Craig (November, 1897), a ten-months old calf—one of the lot reared by their tuberculous mothers—has re-acted. The mother has re-acted from the first and became a "buller" in the summer of 1897. Among the four crops of calves as yet tested, thirty-two have been from re-acting mothers, and this now re-acting calf is the first that has re-acted.

WHAT THE FARMER COULD DO.

Here then are two successful attempts to cope with bovin tuberculosis, and the principles behind them are applicabl to all cases. In a dairy herd the Thürebylille and in anothe the Castle Craig method might be followed; or, if the stock breeder were afraid of the latter method, for undoubtedly b it the calves run more risk than by the Thürebylille method he might follow the other. He might not be always s fortunate as to get such very good results; but, by eithe method, and, within a very few years, he could raise from a unsound foundation a herd with every one of its member perfectly free from tuberculosis. To do so would require extr trouble and carefulness, but what can we improve without a expenditure of this kind? If briefly one would say what ar the chief things to be done they would be:

(1) Test with tuberculin at least once a year.
(2) Isolate the unsound.
(3) Disinfect the premises once or twice a year.

GOVERNMENT CONTROL.

Although Great Britain is among the greatest sufferers, she i among the last to take action. We are a wealthy nation, i complete isolation, with a dense bovine and human population but we are mostly miners and ironworkers and manufacturer and shippers: hence, perhaps, our lagging behind in matters agricultural. In comparison with ourselves, rapid progress has bee made in America and France, for instance, and even such comparatively poor countries as Denmark and Switzerland suppl tuberculin to farmers who undertake to make use of it upo their cattle. It may be said, of course, in regard to Denmar and Switzerland, that their cattle is their wealth; but that is n reason why another country whose shipping is some of it wealth should annually produce a million pounds' worth of ironclads to defend that shipping and spend a few thousand pound

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* From 'The Results of the Use of Tuberculin in the Castle Craig Herd.'

to make itself believe it is doing something for its agriculture. Perhaps a suggestion of what might be done in this country to eradicate tuberculosis and what the cost would be may not form an inappropriate conclusion. The method to be suggested may not be the best and it may not be the cheapest, but it would be thorough; and for this reason, might finally be more satisfactory. As has already been stated, the disease is vastly more common among cows than among fattening and growing stock, and it is with the former, therefore, that we shall have to deal, because, with simple precautions, the diminution of tuberculosis among cows would bring with it a similar condition among other cattle. I would suggest that, in one year, the four million cows and heifers in-calf or in-milk and all bulls be tested with tuberculin; that the unsound be permanently branded * or ear-marked and separated from the sound; that infected premises—all premises, perhaps—be disinfected before being used for healthy animals; and that, thereafter, stock-keeping proceed in its ordinary course. The second year, as the already branded cows need not be again examined, only the remaining unbranded cows and the year's draft of heifers in-calf would require to be tested: making two million to be tested instead of four. New reacting animals would be branded, turned among the branded animals of the former year, infected premises would be disinfected, and, thereafter, matters would go on as before. The third year and every succeeding year the number of animals to be tested would gradually diminish † until, by the tenth year, at the very utmost, we might reasonably expect the country to be free from disease. At the end of that time, if there were any suspicion of danger, it might be made a condition that any diseased animal then left in the country should be slaughtered.

But, in addition to the main points of such a scheme, there are others to be considered. Perhaps the stock-owner's chief difficulty would arise in the disposal of the milk from his tubercular cows through the action of the public health authorities or through the enlightenment of the public itself; but, if this difficulty arose, it could be met by the milk being sold sterilized or by the tuberculous cows being used for calf rearing only. The latter course might tend to bring about a dearth of cows for milk selling purposes, but this overbalanced state of affairs

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* If they be not distinctly and permanently marked, then we have an intensification of the present vile practice of some cow-owners testing their cattle and immediately putting the reacting upon the market. It might be advisable to mark the non-reacting also.

† Clean farms originally, or farms that have become clean and to which no cattle have been brought in, need not be tested again.

would at once be put in equilibrium again through the dairy retaining his sound cows longer and disposing of his unsc as well as through more heifers being retained for cows fewer being put up to be fattened. In addition to what already been suggested, it should be made a condition that c brought up by hand should be fed upon boiled milk, and where calves are being suckled by tubercular cows, the cows calves have constant or daily access to open fields, and their houses be ventilated often and disinfected, at least, a year.

It may be noticed that between this suggestion and method adopted by the Danish Government there are at two important differences. The first is that in Denmark application of tuberculin is not compulsory and universal. this country, which is a country of markets and fairs ar people who seem to delight therein, this would simply mean an owner who had not tested his cattle, but whose cattle badly affected, would put upon the market animals with e appearance of soundness to spread the disease in every dire and frustrate the efforts of those making an attempt to deal the disease: it would be merely putting the man with s cattle at the mercy of the man with unsound, as at pre The second point of difference is that in Denmark "tuber must be applied to the investigation of young cattle"—a me which ensures the good health of nearly a hundred per cer the young cattle. But what is to be done with the present that are sound? Are they to remain tied up beside the unsou and is the rising generation of sound cows to be put among mixture of sound and unsound, or are there to be three divis of cattle on every farm—1, sound and unsound cows untes 2, sound cattle since testing was begun; 3, unsound cattle s testing was begun? It might be argued against the sugges to test only cows and in-calf heifers that we still leave y and fattening animals to be infected by each other. No do but among those animals by themselves the risks of infe are small. The chances of rising calves and future calves b diseased are exceedingly small, and, since all, with the excep of future cows (which have to be tested), are sold off year or two, a tuberculous animal in this section of our stock, after four or five years, would be a rarity. Besides, i young animals, as well as all healthy cows, are to be te annually, the expense of clearing out the disease in seve eight years would be as many millions, while, by the sug tion now made, the disease would be cleared out in about years at a cost of a million and a half.

The expense and the officials to be created may give some c for alarm. But we have already a Board of Agriculture and its officials to whom we have become accustomed; we have also an efficient veterinary profession whose ranks are being continually augmented; we have also plenty of intelligent men to whom the mere routine of tuberculin testing might be trusted; and we have also a police establishment—alas, that it should be required!—equal to seeing that the Government regulations are efficiently carried out. If we reckon that the testing could be carried out, by these officials, at a cost of 2*s*. per head, our outlay the first year would be 400,000*l*., the second year 250,000*l*., the third year 150,000*l*., the fourth year 100,000*l*., and so on. The sum total may be large, but, compared with the farmer's loss in ten years—to say nothing of public health considerations—we have to place only a million and a half against thirty millions!

II.—*The Control of Sex in Breeding Live Stock.*

By WILLIAM HOUSMAN.

FAILURE OF NARROW THEORIES.

THEORIES of sex-control are counted by hundreds. Most of them are alike narrow-based, on single ideas. Science rejects the bulk of them, and practice has not yet found one theory worthy of absolute and unconditional reliance. Yet neither science nor practice, nor science and practice combined, can dismiss the question as useless. Both, on the contrary, are inclined, not only to entertain it, but by their respective methods to deal with it more thoroughly than it has been dealt with in the past. If a little more scientific method were observed in practice (a term by which the ordinary business of live stock breeding is intended to be expressed), and science were more liberally supplied with facts thus brought under intelligent observation, progress might be hastened towards the discovery of at least some measure of control; shall we say to the extent of occasional (or even frequent) conditional control over the proportions of the sexes in the offspring of our domesticated animals?

The theory of animal reproduction may be introduced briefly thus. Schleiden's cell theory of vegetable structure (1838) was by Schwann (1839) extended to animals: "To recognise the ovum [female element] as a cell, and the spermatozoon [male element] as another, to find the starting-point of the organism in the double unity formed by these two, to demonstrate the process of development as one of cell multiplicatic and arrangement, express great but not final biological facts." This cell consists of what in science is termed protoplasm, the elementary organic basis of living matter. The theories the determination of sex on a basis thus formed are many an frequently conflicting.

"LET NATURE BE YOUR TEACHER."

Before examining any of those still supported theories, of whic more than one may possibly be proved to contain, or to b founded upon, some truth, suppose we have a look at Natur working under appointed laws, to see if we can find any indi cations of influences controlling the proportions of the sexe in animal and vegetable life. If sex be determinable by ex ternal influences acting upon the parent animal or the paren plant, and if we can by observation decide what influences s act, we gain a step towards the knowledge we require to enabl us in some measure to control sex. In the event of findin certain conditions in Nature favourable to the production of a extraordinary majority of males, or an extraordinary excess females over males, we should ask ourselves the question—ca those conditions, or conditions of similar effect, be supplie artificially? The affirmative answer, if established by a suff ciency of facts, would mean that a measure of control of se had been reached by man from observation of natural laws.

LESSONS OF A MEMORABLE YEAR.

In the West of England, over an area of which the cities Bristol and Gloucester form two side landmarks—and how f beyond I cannot say—the year 1825 was remarkable for tl scarcity of female calves. Even dairies of forty or fifty cov produced not more than five or six, and the prices of heife to rear for dairy purposes rose according to the insufficien of the supply. Whether in connection with the causes this extraordinary disproportion between the births of ma and female calves in that year, or from other and entire distinct causes, I do not know, but in a part at least of tl same district, in the spring of 1826, the ewes manifested a normal fecundity, some bearing three lambs each, and o farmer had as many as sixteen lambs from five ewes. T sexes of the lambs are not stated, and the incident mentioned only as a curious coincidence, although it m

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* 'Evolution of Sex,' by Prof. P. Geddes and J. A. Thomson: W. Sc 24, Warwick Lane, E.C.

be more than that, inasmuch as conception occurred in the autumn of 1825, and was therefore partly concurrent with that of the singularly large proportion of male calves produced in the dairy herds of that district. My authority* without reference to the facts just stated, records the remarkable atmospheric phenomena of 1825. The winter of 1824–5 was mild and wet, the following spring dry, with keen winds and frosty mornings, and quite unusually heavy falls of honey-dew, which continued until about the middle of July; the summer was one of extraordinary heat and drought, stripping trees of their leaves, cracking the earth, and warping wainscots, door-frames, window-sashes, and household furniture, driving the young rooks (like hedge-row birds in winter) to the very doors of the dwelling-house, half roasting potatoes in the ground, and quite withering up fruit on the trees and bushes, ripening in the open garden the seeds of exotic plants, usually grown in greenhouses, and almost annihilating the polyanthus varieties and other cold-climate flowers. Water was scarce. Cows lost nearly all their milk. Rain fell in August and September; the earth then grew green again; bare trees were clothed with tender green foliage as in early spring, and on the 1st of November (notwithstanding some little previous sleety rain, with snow on the hills), dog-roses were to be seen hanging like garlands on the hedges. Early in January, 1826, a violent storm of wind was followed by a brief but keen frost and deep snow, then a thaw, an unusually mild residue of winter, and a spring of the richest profusion of blossom and the fairest promise of abundance of every product of the earth.

In connection with the extraordinary fecundity of ewes lambing in that spring, an autumn circumstance of 1825, not noted by the author in that connection, but recorded merely as an illustration of the genial weather, may be here introduced. Describing a brilliant day (the 11th of October), he brings in as accessories the cattle reposing in the shade, the thermometer varying from 66° to 68° Fahr., and the general warmth of feeling in the human breast greater than that indicated by the instrument. The ewes, therefore, about the time of conception, would be living in the height of luxury like that of a warm and bountiful midsummer, well-fed, and much in repose, sharing, no doubt, the gladness of man under most favourable conditions of sunshine and sweet air. That such conditions might have some effect upon the reproductive system seems highly probable; the large yield of lambs in the spring may be not unreasonably regarded as possibly a consequence; if that were the case in regard to the number of offspring, ı we not within the limits of sober reason consider whethe connection may not have existed between the atmospheric pe liarities beginning with the winter of 1824–5—seasons on whole unfavourable to the prosperity of cattle—and that ex ordinary excess of male over female calves in the year 1825

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* See Knapp's 'Journal of a Naturalist,' third edition: London, John Murray, Albemarle Street, 1830, p. 138.

SUPPOSITION OF SEXES, ALTERNATE OR OTHERWISE, IN OVA.

Various leading theories of sex, and the question how far suggestion just offered would accord with certain of them, shall examine presently. In the first place, we must bea mind the fact that fertilisation is effected by the joinin a spermatozoon, the male element, to an ovum, the fen element. Next we may briefly refer to the theory that tl are male ova and female ova, that is to say, although the se of the ova are not distinguishable by any means of examina yet known to man, that certain ova, whether unfertilised already fertilised, and if fertilised, by whatsoever male t are fertilised, and howsoever great or small the potentialit that male, are unalterably female ova, and certain other (fertilised or unfertilised, &c., as just said) are unalterably n ova. We are invited to suppose that the spermatozoa by wl they become fertilised, each imparting the complement of essentials of a new life, stimulate to growth, and communi the male influence, effective as regards form, colour, and o properties of the male parent, excepting sex, which is n wholly by the inscrutable male or female destiny of the ov prior to fertilisation. This theory I have endeavoured describe in my own way, avoiding as far as possible, a as in other cases, defining, when I must use them, the te of science. Messrs. Geddes and Thomson, whose own spe theory, that male reproduction is associated with prepondera katabolism, and female reproduction with relative anabolis is elaborated in the work already named, observe that the the of sex in ova held by Schultze and others is more tha mere begging of the question; even the grounds on whic is founded are not admitted as correct. Depending upo are questions of the distribution of male ova and female c

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* Anabolism and Katabolism, terms introduced by Dr. Gaskell: the fo (winding up) analogous to sleep, rest, restitution, charging or loading; the l (running down), waking, activity, wearing out, discharge. Phases of alte activity and repose, thus designated, are comprised in Prof. Foster's t Metabolism (change), applied to the changes of living "cells." See Mor 'Animal Biology,' and Dr. Burdon Sanderson's 'Presidential Address,' Sectic British Association, 1889.

d in connection with a supplemental theory to the effect ıt male and female ova are produced in the female ovary regular alternation, we have directions for the control of x. If, for example, an animal of a species producing off-ring singly happens to have as first offspring a female, in der to breed another female we muſt be careful to miss the st heat and see that pairing takes place at the second heat; or iling that, at the fourth, sixth, or eighth, never uniting the sexes any of the intervening seasons of heat, as then, in the event receptivity, the offspring would be male. This theory, how-er, has proved light weight in the balances of science, and s been tried too often by practical breeders to retain much ld upon the common mind. In bees we have examples of nole broods of one sex alone. The unfertilised brood produces ones (males) only. The facts that self-multiplication, as served in low animal orders, is distinct from reproduction, id that the lop-sided manner of production called partheno-nesis, which is exemplified in the hive bee, is distinct from th self-multiplication on the one hand, and reproduction sexual union on the other, must be borne in mind when e take lessons from parthenogenetic and self-multiplying imals in illustration of our subject. However, in passing, e may note the curious fact that abortive parthenogenesis metimes occurs in birds and even in mammals, unfertilised gs of common fowls, and ova in mammals, having been iown (by Oellacher, Bischoff, and Hensen) to "start off" ithout male help. Development, however, soon fails, and no ving offspring come of the extraordinary effort.

As regards the alleged alternation of sexes, every poultry eeder who has fairly abundant knowledge gained by his n observation, knows that a particular hen, from which saves a "sitting" of eggs, laid in unbroken sequence, and pt apart so that the brood shall be all her own, sometimes ves him chickens all or nearly all of one sex. In a litter of, y, a dozen pigs, eight, nine, or more may be of one sex, and ly the small minority of the other sex. But observations the pairing of horses and cattle and of the sexes of the als and calves of consequent birth, under my own direct anagement and personal supervision, have convinced me, the scarcity of facts favourable to the theory, and the abund-ice of contradicting facts on record had not already done , that in the equine and bovine species the theory fails not ss signally than in species which produce a litter at a birth, id in species which lay eggs easily tested by dates written on ie shells and by marks made on the young birds as they me out of them. In these days of patent incubators and inanimate nurses yielding artificial heat, experiment is easy. The birds as they come out may be safely marked by clipping the down on the upper part of the wing near the shoulder (avoiding the lower part, where there is danger of clipping the budding quills, so injuriously drawing blood), the second clipping to be a little off the ends of the quills when they are well grown and the coming feathers threaten to erase the markings on the down. The birds may be marked by clipping the right or the left wing according to the date of the egg (all the eggs being from one hen), so that on the alternate-sex theory all birds with the left wing clipped should be of one sex, all clipped in the right wing of the other. They certainly do not so prove, as they grow up; at least mine do not. Testing the eggs of a plurality of hens together, as room in the incubator may permit, other marks may be added, on the head, back, &c., memoranda being kept of the mark denoting the mother, so that her offspring may be identified.

CONCLUSION ON ALTERNATE SEX THEORY.

The excess of male calves in the year 1825 presents to the alternate-sexes theorist a choice between two extremely improbable suppositions. Either (1), a not less remarkable excess of females must have occurred in the immediately preceding and following years, unnoticed by the recording authority, a minute observer and diligent gatherer of facts; or (2), throughout a wide district, containing many thousands of breeding cows, a vast majority of the cows which had bred female calves in 1824 must have bred from odd-numbered heats when they conceived the offspring dropped in 1825, whilst a similarly large majority of the cows, which in 1824 gave birth to male calves, must have conceived their calves of 1825 in the even-numbered heats. In addition to this double improbability of coincident suspensions of the law of averages, the theorist is bound to the supposition that the normal proportions of the sexes were regained by an equally improbable repetition, or rather reversal, of extraordinary coincidences, in the case of the calves of the year 1826. We may here, I think, dismiss the theory of alternate sexes, as regards ordinary live stock breeding, whilst we leave the question of sex of ova open for further discussion.

RECOGNITION OF MALE AND FEMALE INFLUENCES.

In the theories which we are about to consider, the influence of both parents as factors controlling the sex of the offspring is generally assumed. We have to put aside, therefore, in lowing the argument for each theory, the notion of a fixed l unalterable sex in the ovum before fertilisation, yet, with s reservation, there may be a "tendency" to one sex or the ier, both in the female and in the male element, both in the ım and in the spermatozoon. Still, as I have already ıted, we must be guarded in respect of sex in ova, and not hastily dismiss the question as settled in all cases in the ative. In some of the lower orders of animals, we find parently clear evidence that sex is unalterably determined in ova. In some of the minute aquatic crustaceans, so far as ence has yet penetrated, the process of reproduction appears be purely parthenogenetic—females producing females with- intervention of the male element; indeed, males have never n discovered.* In certain infusorians, which multiply by isexual or asexual division,† the process was formerly supposed be infinite; but later experiment proved that the conjugation two unrelated bodies was necessary to its continuance beyond ertain length of time, which is believed to be the term of the of the individual, and to end nearly at the same time in all separate bodies produced by division. Those separate bodies pear to be incapable of conjugation with each other, or if, in absence of an unrelated body, any two come together, the proach seems only the last and ineffectual effort of life to ape extinction with the individual and prolong itself in the e. But let an unrelated individual of the kind be intro- ed before vitality is too far spent to effect further multipli- ion, and conjugation saves the kind; the one body formed the union of the two starts afresh the process of division and division, and produces in a short time tens of thousands. hough the process of reproduction in mammals and birds is y different from that of the lower orders of animals, we uld avoid intellectual cramp, and the consequent inability free ourselves from crude conceptions and prejudices, by a e detailed examination of the subjects of sex, reproduction, ilisation, and embryology than space here admits of. In lying these subjects, the excellent articles in the 'Ency- edia Britannica,' 9th edition, the various other works to ch reference has been already made, Professor H. Alleyne holson's 'Manual of Zoology' (7th edition: Blackwood, 7), the English version of Steenstrup 'On the Alterna- of Generations,' issued by the Ray Society in 1845, and, ng recent publications, 'Animal Biology' (C. Lloyd Morgan),

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Dr. Carpenter ('Zoology,' Revised ed. of 1857) suggested that the males, aps totally unlike the females in appearance, were mistaken for another ies.

See 'Ev. of Sex,' Geddes and Thomson, p. 165.

containing a section on embryology, will be found usefu Many of the standard works, however, are German, son French, hitherto without English translations. Sutton, prominent in investigations of the hermaphrodite stage development of the fœtus, should be, of necessity, consulted.

PARTHENOGENESIS.

The honey bee, as already mentioned, illustrates an appare difference of sex in ova in some instances. Subject to a further discoveries which observation and experiment may gi us, we may reasonably infer that there is, if not a fixed sexu "destiny," at least a strong "tendency" towards one or t other sex, in the ova, and if in the ova, why not also in t spermatozoa? About forty years ago, when, as a bee-keep and from a general love of natural history, I was first interest in the subject of parthenogenesis ("the production of new in viduals from unfertilised ova, and therefore without the int vention of a male."—Professor Nicholson: *Parthenos*, a virgi *genesis*, birth) I corresponded through the press with a prom nent West of England authority, Mr. Woodbury, of Exet who, in answer to my questions, published some notes of observ tions upon the cross of the English dark-coloured hive bee a the Ligurian queen, which is distinguished by several mark characteristics, including variegation and brilliancy of colo The first brood comprised pure English drones alone; afterwar came the brood of workers (undeveloped females), and queen queens (developed females), all showing the mingled charact istics of both English and Ligurian bees. The young queens this cross, given to pure English swarms, produced first dron of half-breed, like themselves, then queens and workers, qu evidently three-fourths English. Mr. Woodbury's statement fully supported by Hensen's experiments with German quee and Cyprian and Italian drones. I must ask the reader accompany me patiently in this examination of insect rep duction, because I think that if we find the key to the contr however slight, of sex, we shall find it by tracing up from lov to higher organisms.

The suggestion of parthenogenesis of the hive bee ca originally from Aristotle, and (with the additional discove that the parthenogenetic brood is wholly male) is confirmed modern observation and experiment. We are now furt taught that by an arrangement in the organs of the female, th is the queen bee, the fertilising elements received in nuptial flight and stored for fertilisation of the eggs several are cut off from the eggs which produce drones and admitted hose only which produce females, to be queens or workers ccording to their place and nutrition in the cells. The future ueens have larger cells and special food provided for them, in he strength of which food they grow to the accommodation of heir royal apartments, and attain to the perfect development f females and of queens. Those eggs which are to produce workers are placed in ordinary cells, and as larvæ are fed on ommon food. If by chance some of the royal food falls to them, they do not rise above the station of workers; but they sometimes, although incapable of fertilisation, produce eggs, from which drones only proceed.

ENVIRONMENTAL INFLUENCES.

Von Siebold's examination of eggs from drone-cells showed in every instance the absence of spermatozoa. A species of wasp, however, which came under his observation, whilst the facts recorded by him serve also as matter for the reasoning of Rolph, has both males and females in the fertilised ova,* and its unfertilised or parthenogenetic eggs may produce a small percentage of females. From spring onward, *warmth and food increasing*, the percentage of *females* from fertilised ova largely increased, up to the end of August, when, food becoming comparatively scarce, and warmth declining, the percentage of females also began to decline. Upon this Rolph makes the general remark that we may without scruple conclude that production from fertilised ova increases with the temperature and food supply, and decreases as they diminish. In a series of experiments with unfertilised (parthenogenetic) eggs of the same species of wasp, the results proved that all were males excepting those produced when food and other factors which tend to build up and sustain were so abundantly present that the minimum period of pupation sufficed to bring them forth. Upon these results Messrs. Geddes and Thomson remark significantly that the peculiarity of the case is that "if the experiments were correct, where the production of males (in parthenogenesis) is the normal condition, favourable environmental influences appear to introduce females."

TESTIMONY OF TADPOLES.

The reproduction of the frog affords still stronger illustrations of this principle of partial subjection of the parental influences, which act in the fertilised ova and during the development of the young in the spawn-bed, the egg-shell, or the womb, to the influences comprised under the foregoing term "environmental." The natural history of the frog also introduces to our notice the modern discoveries of the hermaphrodite stage in the development of animals,[*] thus preparing us to consider the possibility of a large plurality of factors engaged in the decision of sex in the offspring of the live-stock of the farm.

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* 'Ev. of Sex,' pp. 44, 45.

Yung, the leading authority on sexual development in the frog, quoted by Geddes and Thomson, most distinctly shows by his experiments that "external influences, and especially food," decide the sex. In some cases, however, full-grown frogs are hermaphrodite, and Pflüger has declared that there are three varieties of tadpoles, distinct males, distinct females, and hermaphrodites. "In the last, testes, or male organs, develop round primitive ovaries, and if the tadpoles are to become males the enclosed female organs are absorbed." One of Yung's experiments is very remarkable indeed, as showing, if correct (and it is received as beyond question), that even after sex had been once decided, the decision was in some instances reversed under the influence of nutrition. Three lots of 100 each were taken for experiment. The first consisted of 54 females and 46 males; the second of 61 females and 39 males; and the third of 56 females and 44 males. The average thus shown was 57 per cent. of females and 43 per cent. of males. The first lot, fed upon beef, became eventually 78 females and 22 males; the second lot, fed on fish, 81 females to 19 males; and the third lot, reared upon the especially nutritious diet of frogs' flesh, grew into 92 female and 8 male cannibals. This particular series of experiments does not appear to have included any individuals in the hermaphrodite phase. In other instances experiments with hermaphrodites show scarcely questionable tokens of the power of nutrition as a factor in the decision of sex; but, owing to the impossibility of saying with certainty that the hermaphrodites would not have developed in the same proportion of females to males under any other course of feeding, these experiments are, perhaps, not absolutely conclusive. T actual change of sex is considered conclusive, and the on doubt which suggests itself is as to whether, after the sex the frog is once apparently decided, a change does not som times take place under normal conditions of nutrition. T facts, however, which stand upon high authority, greatly favo the supposition that environmental agents have much to do wi the decision of sex in frogs.

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[*] Sutton has been already referred to in connection with this subject. Laulanié ('Comptes Rendus,' 1883) has described in the development of the chick of the common fowl three phases during incubation, which he terms—(1) Germiparity, (2) Hermaphroditism, and (3) Differentiated Unisexuality (see 'Ev. of Sex,' G. and T., p. 66). Hermaphroditism begins on the seventh day. If the chick is to be male, the female ovules disappear from the testes on the eighth or ninth day; if a female, the male ovules have by the tenth day disappeared from the ovary. In some animals the hermaphrodite stage is of longer, in some (and mostly in mammals) of shorter duration. In animals generally, however, even to the highest order, and in some species particularly, partial hermaphroditism may be indefinitely continued, and pathological hermaphroditism (as in crowing and cock-feathered hens) may be developed in the previously fertile adult.

THE POLYSPERM THEORY.

"Polyspermy," or the determination of sex by the number sperms admitted into the ovum—the greater the number sperms the stronger the chance of males—is a theory associat with the name of Canestrini; but since the rarity of more th one sperm entering the ovum has been repeatedly demonstrat to be exceptional, this theory is no longer seriously discuss in scientific circles.

THE THURY THEORY,

that a fresh (that is recently liberated) ovum usually produc a female, while an ovum of which the fertilisation is lo delayed usually produces a male, caused much exciteme among stock-breeders when it was promulgated about thirt four years ago. My father, the late R. F. Housman, editor the "Shorthorn Intelligence" of 'Bell's Weekly Messenge took it up with considerable warmth, not as one which at on commanded his entire confidence, but as the theory of a pra tical breeder, who brought up his facts in such remarkab number and harmony that the theory based upon them seeme worth at least the test of patient and impartial experimen The directions to observe the first indications of heat, and pair as early as possible, for female offspring, or towards the en of the period of heat for male offspring, were strongly con mended to the notice of breeders, and especially of Shortho breeders. In our own herd at Lune Bank, Lancaster, t breeding cows were always thoroughly well watched, being ke in fields close at hand, and one or more of the bulls were fr quently led through the herd at pasture when any cow or heif was expected to come in season. The conditions of M. Thu were carefully observed, and among the breeders who prompt responded to a request for concurrent experiment was the la Mr. Edward Bowly, of Siddington House, Cirencester, m father's valued friend and constant correspondent. Sometim two or three heifers coming from early service of their respe tive dams gave one or other of the experimenting breede encouragement to hope that the secret of sex control had be discovered; but when the total results were compared, we fou so close a likeness to the results of haphazard late or early servi —about every alternate calf proving in sex the reverse of tl which theoretically it should have been—that we all eventual abandoned the Thury method of trying to catch the ova in th female stage when we wanted heifers, or waiting for the chan to the male phase when we wanted bulls.

DÜSING'S CONCURRENCE.

About twenty years later than Thury's introduction of l theory to the general notice of live-stock breeders, Düsin authority gave it renewed weight; but it also has tributa commendation in facts noted by other accurate observers, so of them of much earlier date. Thomson and Geddes rema that Cornaz and Knight have both practically confirmed it, a that Girou has pointed out that female flowers fertilised as so as they were able to receive pollen tended to produce fem offspring. They add that "Hertwig has also shown that t internal phenomena of fertilisation vary somewhat with t age of the ovum at the time;" and that "Hensen is inclined accept the general accuracy of Thury's conclusion, but *exten it to the male element as well.*" The italicising here is my ov to emphasise the thought of Hensen, which may well sugg an explanation of the frequent failure of Thury's theory wh tested by practical stock-breeders. I have once or twice alrea alluded to the narrow foundations upon which many theor are expected to stand and allowed to fall; and I submit tl perhaps one of the great hindrances to progress in discovery practically serviceable principles relative to the question of t control of sex, is haste to claim discovery of a single and an fallible rule. If sex is, as I think the bulk of evidence sho undetermined in either the ovum or the spermatozoon, and as I think we have also abundant evidence to show, envir mental influences affect the parental influences in the det mination of sex, we must be prepared to deal with many a sometimes conflicting factors, and not seek solution of c question in the unmodified influence of any single fact Hensen's thought, as expanded in the quotation to which I ha already referred, is that "a very favourable condition in bc ovum and sperm will probably lead to the formation of female." The further remark, "according to its condition sperm may either insufficiently corroborate the favourable st of the ovum, or constitutionally strengthen an ovum less sat factorily conditioned," may convey perhaps to a mind that expert in terms of science a clearer meaning than it conveys to one's duller understanding dimmed by long engagement with the production of crops and cattle. What is *insufficient corroboration,* as here used to account for the failure to develop a certain sex, and in opposition to the *constitutional strengthening* which secures the development of that sex ? Is it as if a man were to tell a direct falsehood, and one did not care so to characterise his statement, but simply said one could not sufficiently corroborate it ? To ordinary powers of apprehension the facts upon which (as regards the question immediately before us) science rests, suggest the idea of influences *in conflict ;* some influences, parental and environmental, tending to produce female offspring, other parental and environmental influences tending to produce male offspring. If one parental influence is in favour of the female sex, and the other in favour of the male sex, the stronger, unless thwarted by environmental influences effectively favouring the weaker, will prevail. If handicapped by external conditions tending to support the weaker, the stronger may fail. But if a strong parental influence in favour of female development should happen to be not insufficiently corroborated, but even not in the least degree corroborated, yet not opposed, by the other parental influence, and environment to be, say neutral, or not distinctly unfavourable to the strong, then, surely, if the determination rests with the greater aggregate of power in the parental and external influences, the sex will be female ; and the contrary in reversed circumstances.

DIRECTION OF MALE AND FEMALE INFLUENCES.

Here it is well to observe that speculation, if not fact, is inconclusive upon the question whether the tendency of either parent is to produce its own or the opposite sex ; and I may state, for what it is worth, my own strong impression that some males have a decided tendency to beget offspring of their own sex, and other males a tendency not less decided to beget female offspring, and that not by surrender of their own influence but by assertion of it. I have received this impression from observation of the offspring of a large number of animals of both sexes (in various species), and from facts gathered out of such works of live-stock registration as the various Herd Books, and it has been one of my life-long studies. An equally strong impression that some females also have as decided a tendency to breed females, other females to breed males, is a result of the same study. If this be so, it sufficiently accounts, probably, for the differences of existing opinion upon the question whether the animal, male or female, has an influence tending to produce its own or the opposite sex. The obvious solution of the question how sex would be determined in the event of two powerful and opposed parental influences meeting, is that, as in the case of well-matched wrestlers, one or the other must eventually yield; whilst if outsiders were to interfere with the wrestlers, or environmental conditions with the parental influences, the result of the strife would be hastened.

STARKWEATHER ON 'THE LAW OF SEX.'

The title here quoted is that of the often mentioned work of the year 1883, by Mr. C. B. Starkweather. The main line of its teaching is that the "superior parent" produces the sex opposite to that of the superior parent herself or himself, as the case may be, for he maintains that "neither sex is physically superior, but both are essentially equal in a physiological sense," and that the parent that happens to be individually the stronger, not by reason of sex but from constitutional and necessary causes, rules the sex. If the mare be "the better horse," the foal is a colt, if the stallion's influence prevail, it is a filly; but Starkweather's facts and reasoning relate chiefly to man, and mental is coupled with physical strength as one of the constituents of superiority and conditions of ruling power.

Girou, however, maintaining the theory that "comparative vigour" is the secret of predominance, differs from Starkweather upon the result of that predominance, asserting that the sex of the offspring is that of the more vigorous parent. The hypothesis of Richarz takes the male as representing a higher degree of organisation reached in the embryo state when the reproductive power of the mother is especially great (beyond that of the father), and the male offspring of the union consequently resembles the mother rather than the father.

In an article upon "Ponies; their Breeding, Uses, Management," &c., contributed to the 'Live Stock Journal Almanac' of 1889, Mr. C. W. Wilson, of Rigmaden Park, Kirkby Lonsdale, Westmoreland, referring to the question of the possible control of sex, says that his own opinion, founded upon experience and observation extending over many years, is that prepotency is contingent upon the superior constitution of the parent at the time of service; that if the sire is the stronger and more robust, the produce will be chiefly males; if the dam the stronger, mostly females; so taking the view of Girou in the particular in which it is opposed to that of Starkweather.

Upon the theory of "comparative vigour," Geddes and Thomson remark that it is the theory best known and probably e most influential; but in reference to the hypothesis of irou they hold that it cannot be said that facts bear out the ase.

ALLEGED PREDOMINANCE OF THE OLDER PARENT.

Hofacker (in 1823) at Tübingen, Wurtemberg; Sadler (1830) n England, and at various times; Stieda in Alsace-Lorraine; erner in Scandinavia, and other statisticians who have analysed he populations of cities and country districts, have published laborate tables of births, showing the differing proportions of he sexes when the mother and father respectively was the lder. The two first named contended that when the male arent is the older the majority of male births is decidedly bove the normal majority of that sex. Their figures supported heir opinion, and those of five other statisticians in France and ermany tended to confirm it. The seven independently compiled tables together comprised 79,049 births. The statistics of Stieda and Berner (the latter dated 1883) contradicted the agreeing evidence of all the rest, and although as regards authorities there are but two against seven, each of the two had dealt with a considerably larger number of births than all the rest put together—Stieda 100,590, and Berner 267,946, making an aggregate of 368,536 births, against the 79,049 of the seven; so illustrating the wisdom of Hensen's remark that *unless statistics are enormously large they prove very little.* It is, I apprehend, the want of ample statistics of facts from widely distant places, observed under a great variety of conditions, that constitutes the weakness of most of the theories relative to the control of sex and explains the rejection of those theories (which may have some truth underlying them), when tested in ordinary practice.

CONCLUDING REMARKS.

The fact that a multiplicity of influences has to be considered has failed to receive the attention which its importance deserves. Until we realise the complex nature of the question we have to face when we take up that of the control of sex, we are not likely to make much practical progress, whatever our theoretical results may be. Realising that, we are met by the question, how many of the factors in the determination of sex are, or can be brought, under our control? Take for examples three of what Düsing describes as the many "fates or factors" which "operate at different periods": (1) the condition of the reproductive elements; (2) the period of fertilisation; and

(3) the nutrition of the embryo.* The first, dependent upon "the constitution and habits of the parents," we may to some extent control by strengthening or weakening the constitution artificially, and by regulating the habits of the animals as far as we can do so. Hitherto, however, we scarcely know in what direction to exercise this control, as among the current theories some point to male, some to female, results from identical causes; and at the best our control in this line seems not likely to be extensive. The second "fate or factor," the period of fertilisation, may be more under the control of a careful observer of the females intended for breeding. The third, nutrition of the embryo, is doubtless, in viviparous species, controllable by regulating the nutrition of the female parent, provided we also keep in view the conditions of quietness, sufficient but not excessive warmth, &c., upon which the efficiency of the supply of nourishment largely depends. But it is like the task of an Indian conjuror keeping up many balls in the air at once. Possibly the fragments of truth now divided among many theories may be gathered by patient observers and experimenters among the practical men who, acting upon the motto of the Society for which these notes are put together, "WORK AND LEARN."

III.—*The Polo Pony.* By JOHN HILL.

ITS REQUIREMENTS.

THE requirements of a polo pony are now so many and so varied that thoroughly educated ponies of the right stamp, pace, height, and temper have reached prices which a few years ago would never have been thought of, and first-class ponies will continue to command such prices. The game of polo has altered so much of late years, that the type of pony used for it has necessarily undergone a complete change. "Pace" is now the order all along the line in social as well as business matters. Sport has to keep pace with the times, and it follows that all animals used to promote it have to be bred up to its requirements. So it is with the polo pony—*gallop he must.* Ponies, as well as horses, go in all forms; but an experienced eye can detect the right stuff under a rough exterior. One may sometimes see a pony, which at first sight (and especially when standing still) seems hardly entitled to be classed as a polo pony at all, brilliantly carrying its rider in a first class game.

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* See 'Ev. of Sex,' p. 38, for G. and T.'s observations.

has, perhaps, a big head and light neck, is flat sided, ragged
ped, and goose rumped, but at the same time it has a
ght intelligent eye, well-laid shoulders, muscular thighs, and
arters well let down to strong well-formed hocks, the fore-
s are properly set on, it is short from the knee to the
lock, has flat wear-and-tear bone and sinews, and stands
·2 hands, neither more nor less. Such ponies sometimes
ne from Argentina. They are hard wiry animals that
gallop and stay with the best, and—no matter where
y come from—provided they have "manners," are not to be
carded because they do not happen to possess what may be
med "Showyard good looks." I can call to mind a pony,
swering well to such a description—the celebrated "Oh
," Champion Islington jumper, and winner of over 100 first
zes, including first prize at the late Manchester Meeting of
Royal Agricultural Society for the best Polo Pony brood mare.
The ideal stamp of a polo pony is exactly that of a blood
ight-carrying hunter compressed into 14·2 hands; and
e hunters, they must be adapted to carry heavy as well as
ht men. The most valuable hunters are the blood weight-
rriers, because they are the most difficult to find, and so it
with pure bred polo ponies. Like a hunter, the polo pony
quires all the best attributes of the perfect horse—courage,
tivity, strength, stamina, speed, and sense. In addition to
ese natural gifts it requires to be most carefully broken and
ined, and to be in as good hard condition as a racehorse.
is not surprising that such animals are both hard to
d and still harder to breed, and that when found they
mmand high prices.

GENERAL APPEARANCE AND TYPE TO AIM AT.

With regard both to the general appearance of the pony to
k out for with a view to purchase, and to the type for the
eder to aim at, I may be perhaps allowed to quote from my
face to the first volume of the Polo Pony Stud Book, which
s:—"In the first place this Stud Book was formed for the
gistration of ponies suitable for *riding purposes*, and for pro-
ting the production of such; the *weight-carrying* blood polo
y being the type which the Society considers the one to be
ned at. At present there is no distinct breed of '*riding*'
nies, and there is no animal scarcer, or worth more money as
ony, than one which will carry a heavy man safely and easily
a hack. I mean a pony standing from 14 to 14·2 hands,
th blood-like head, intelligent eye, neck well set on,
ulders strong, but sloping well into the back, good deep

barrel, well coupled loins, tail well carried, long quarters, clean cut hocks, and hard wear-and-tear forelegs. Made on some such lines as these, he must be a safe and fast walker, putting his feet down without catching his toes, and stepping well out from the shoulder. Such a mover can, as a matter of course, almost invariably trot, canter, and gallop."

Mr. E. D. Miller, in his work on 'Modern Polo,' says:—'A first-class pony is of more importance to an ambitious polo player than is a first-class hunter to a man who means riding in the first flight in the Shires; for many faults of mouth and manners may be overlooked in a brilliant cross-country horse, but not in a polo pony, which must be perfection itself in a game. For instance, a fine horseman on a puller which can gallop and jump can get across Leicestershire with a fair amount of comfort to himself and safety to others, but a pony which pulls at polo, although he may do well enough in a slow game, is perfectly useless, even to the best of horsemen, in a first-class match. A single fault, such as being a slow starter, shying off the ball, refusing to try when alongside another pony, or a little want of pluck when facing a back-hander, or when jostling another pony, immediately puts a polo pony out of the first class. Again, on a slow hunter, though a perfect jumper, a man who means going the shortest way to hounds can, five days out of six, see a lot of fun even in the grass counties; but a slow pony is absolutely useless in a first-class polo match. . . . If a man cannot afford to play on the best of ponies, he can, however, get his fun on moderate ones; but in that case must forego the pleasures of first-class matches. . . . A fair player, who is also a fine horseman, need spend very little on his polo pony, if he looks about for likely young ones, and if he takes the time and trouble to train them when found. The price of the raw material has not risen at all of late years. More and more good ponies are being bred every season, and the number of breeders is steadily increasing. Doubtless, the efforts of the Polo Pony Stud Book Society will have a good effect in this direction. . . . The ideal weight-carying polo pony is the miniature 14-stone blood hunter, standing on short legs. Provided that he has shape, substance, power, and scope, it does not matter much whether he measures 14 hands or 14·1. . . . The nearer thoroughbred the better. . . . If the pony goes strong and well, has good shoulders and a nice mouth and manners, and is sound, there need not be much doubt about him."

CONFORMATION OF THE POLO PONY.

With respect to the conformation to look for in a polo pony, Mr. Miller so entirely expresses my own ideas on the subject that I cannot do better than quote him. He says that a polo pony should "have good shoulders which will ride well, and which the pony can use with perfect freedom. The best way to judge if a polo pony or hunter has good shoulders is to gallop him down a sharp incline. If he gives confidence when doing this, we may be certain there is nothing wrong with his shoulders. . . . We should never judge a pony's shoulders simply by their appearance."

My own experience in judging hunters in the Showyard exactly bears this out. Hence I hold that all hunters, hacks, or polo ponies should invariably be ridden in the Show-ring, by one Judge at least, before the prizes are awarded. Of course the same rule applies when purchasing an animal, otherwise in very many instances disappointment is certain to occur. A good polo pony, as guaranteed at Albert Gate, must go to the ball, must be capable of being played without blinkers, and must be workably sound.

It is desirable at this point to quote the opinion of the late Mr. J. Moray Brown, who was perhaps the finest judge of polo we had, and whose death in the prime of life was deeply regretted by all who knew him personally, or had the pleasure of reading his spirited accounts of polo and other branches of sport. In him the Polo Pony Society lost a friend and supporter, whose place was hard to fill. He wrote that "the points that make a good hunter apply equally to a polo pony. 'Blood will tell.'" He does not, however, plump for a thoroughbred pony for polo but advocates the blood or Eastern cross. He says: 'The thoroughbred pony does not seem to withstand the constant strain he has to undergo in twisting and turning during a game of polo; his constitution is very often delicate, and his narrow formation in front and high withers prevent him from turning very sharply. . . . Of course there are, and have been brilliant exceptions in the case of high-withered ponies, such as the Fawn, Dynamite, Dancing Girl, by Sefton, &c., which must be very near if not quite thoroughbred; but exceptions prove the rule. . . . Much, therefore, as there is to admire in the speed, gallantry, and the game qualities of our English thoroughbred, qualities which eminently fit him for the hunting-field, yet it must be admitted that, as a rule, he lacks others which, if he is to train into a *perfect* polo pony, are necessary. Though not endowed with the speed of English ponies, Barbs and Arabs certainly have all the other necessary qualities that I have alluded to. Above all they have *brains*." With reference to Exmoor ponies, I agree with Mr. Brown's opinion that there are two distinct types, the old original breed, and the improved Knight strain; and, as the latter are able to live under the same conditions as the unimproved sort, it is a question whether they are not the better worth cultivating. As a foundation for polo pony breeding they must be valuable. Mr. Brown considered that "an improved Exmoor mare by an Arab or Barb sire, put to a small, neat thoroughbred horse with a strain of Venison or Newminster blood in him, ought to produce something very near perfection . . . . Mr. Knight and Sir Thomas Acland have greatly improved their breed of Exmoor ponies by adopting this course, and it would be well if their example were more widely followed."

It is my firm conviction that the small pony foundation is most valuable for polo pony breeding, and that classes for these at the Agricultural Shows and for the first and second crosses from them, for ponies standing up to 13·3 hands, should be supported and encouraged by polo men as much as those for fully developed ponies of the approved polo type. I shall have a few words to say on this subject of small ponies further on.

Mr. Brown sums up his remarks on polo pony breeding as follows: "Considered briefly, I think it may be taken that the best cross for an all-round polo pony is that between an Arab or Barb sire and a good English polo pony mare."

DIFFICULTIES OF BREEDING.

The breeding of horses in general is far more difficult and uncertain than that of any other class of live stock, even when sires and dams can be mated with a full knowledge of their ancestry; but the difficulties encountered in the breeding of polo ponies are much increased by the fact that there is no recognised material upon which absolute reliance can be placed, to work from. Until the formation of the Polo Pony Stud Book no record was kept of the breeding of these ponies. Most of the best ponies have been picked up from time to time by persons requiring them for the game, but with no thought or care as to their individual breeding, or as to what became of them when the season closed. The great majority of these ponies are what may be termed chance bred ones, or dwarf thoroughbreds, stunted in their growth when foals and as yearlings owing to bad feeding or some other cause. In collecting a breeding stud or mating individual mares, there are two courses open, either to start with mares of the recognised polo stamp, or breed up to it from the small mountain and other British eeds. The chief difficulty with the produce from the polo ares is their tendency to grow over 14·2 hands, and of course takes several generations from a 10-hand pony to get one up the orthodox standard. Before the Polo Pony Stud Book was arted the only record breeders of polo ponies had was the ackney Stud Book, in which all ponies might be entered if ssed on inspection by the Committee. But as driving and ding ponies were entered without distinction, those who wished breed the latter did not receive much guidance, and as there ere no separate classes for blood riding ponies at the Shows, nd all the support in the prize schedules was given to "action," e blood riding pony of the polo type had no chance at all the Showyards. It was this position of affairs that led the establishment of the Polo Pony Society. Until then o means existed of recording the breeding of polo or riding onies, and many excellent mares upon finishing their polo areer were entirely lost sight of, finding their way into tradesmen's carts or being utilised for other general purposes.

THE POLO PONY SOCIETY.

The rule for entry in the Polo Pony Stud Book is that all oundation ponies must be passed by the Inspection Judges ppointed by the Society, and as much information as possible ith respect to their pedigree and performances must be upplied. The Society has held two Shows, one at Ranelagh, nd the second at Hurlingham. The efforts of the Society to upply the want of a systematic record, and to obtain a public ecognition of the value of the polo pony have been amply ewarded, and if players will only take the trouble to enter heir mares, breeders will have every chance of selecting uitable animals when forming their stud, and of comparing nd making the different strains of blood, thereby enjoying the ame advantages as breeders of other varieties of live stock. he Society will enter not only polo ponies, but also those of ny height up to 14·2 hands, provided they are passed by the nspectors as being made on "riding" lines. It has been pointed ut that, as these riding ponies can be entered in the Hackney tud Book, there is no necessity for the Polo Pony Stud Book. s a matter of fact many of the foundation ponies are also ntered in the Hackney Stud Book, and some of the best too, specially the well-known "Sir George" strain, brought to uch perfection by Mr. Christopher Wilson, and carried on by ir Humphrey de Trafford, Mr. Hollins, and others. These onies, when mated with thoroughbred or Eastern sires, form a sound foundation for breeding high-class riding or polo poı The value, however, of the Polo Pony Stud Book is that harness element is permitted, the Society being establis solely for the protection and encouragement of the riding p of the polo pony type, and being carried on systematicallȷ those lines.

PERSONAL EXPERIENCE IN BREEDING.

While attempting to describe my own experience in breec polo ponies, I do not pretend to have attained the objec view, but a record of my failures may perhaps be some guid others, and may possibly save some loss of time. Life is o too short to see the results of experiments in horse breed but the experience of the many enables those who are shr enough to take the right line, and so to form and bree stud which makes its mark in the horse or pony world. I comparatively easy for a wealthy man to collect a stud of br mares and purchase the best stallion that money can obt but to start with the material to be found in the immed district in which a breeder lives, and patiently endeavou improve it in each succeeding generation by judicious cross is a very different business. The breeder who starts from sn beginnings, knows exactly the faults and deficiencies bot the foundation stock and of each succeeding generation, with the experience thus gained is better able to correct tl than the man who acts on the report of others, or who wc out pedigrees on paper, without personal knowledge of individual animals. In this immediate district we have Church Stretton hills, upon which run, in a more or less v state, ponies closely allied and very similar to the W mountain breed. They are usually from 10 to 11½ ha high; 12·2 hands being considered the very outside li About seven years ago several of the best and most typ mares, wild and unbroken, averaging about 10 hands, w purchased direct from the hills. These were mated wit large-size imported Arab, standing 15 hands, with good, turned shoulders, deep middle piece, capital forelegs, well-formed quarters—his fault being in his wide action beh both in the trot and gallop. Now this defect, as so o happens, unfortunately stamped itself on the produce. form and quality were otherwise all that could have b expected, and taken altogether the first cross was a succ The ponies were handsome, compact, and hardy, and g into an average height of 13 hands. The fillies from this c were put at two years old to the best Welsh pony we could f with capital riding shoulders, plenty of bone and quality, an a height about 14·1. The reason for adopting this course was the fear that either a blood horse or another Eastern cross might produce weedy animals, which would never, so to speak, "carry a man's boots." This fear, however, as the ponies matured, was found to be groundless, and the half-bred Arabs, so far as bone was concerned, turned out all that could be desired. Another reason for using the Welsh pony sire, was in order that the "*pony*" type and foundation should not be lost sight of in the early stages of the experiment, and also because it was thought that if other than pony blood were used too freely there might be a difficulty in the succeeding crosses in keeping the height well within 14·2 hands. The difficulty, however, was to get the ponies big enough; that is, to reach the regulation height of 14·2 hands.

In such experiments the owner of a small stud is, of course, very much handicapped by the even chance of the mares throwing colt foals or proving barren. For instance, my best first cross mare threw three colt foals running, and the fourth year unfortunately failed to breed. Her first foal, by the Welsh pony before-mentioned, was strong and bloodlike, but with cow hocks and hind action like his Arab grandsire. Her second foal, by a 15-hand hunter-bred horse (whose dam was a noted pony bred in the Church Stretton district, with two crosses of thoroughbred blood on a hill pony), at first showed much quality and character, but did not grow out, and ultimately developed the type of the hill pony foundation dam. Her third foal (only just weaned) by a thoroughbred horse standing 15·1 hands, is beautifully made, full of quality, and in every way promising. The mare was sent again this year to a blood hunter sire, and, if all goes well, the same course will be adopted next season. The opinion I have formed from the result of this experiment is, that starting with the pure mountain pony foundation dam, the Arab cross is a judicious one (provided great care is taken in the selection of the sire, especially with respect to the hind leg action, where the mountain pony is so often faulty), and that the thoroughbred may be safely resorted to for the next cross, without fear of either losing substance or of the produce growing too high for polo. It would all depend upon the way the animal developed and the character it showed whether it would be wise to follow on with another infusion of Eastern or thoroughbred blood. If there seemed to be a danger of exceeding 14·2 hands by doing this, a dip back into pony blood might be advisable.

Another foundation dam, standing about 15 hands, by a thoroughbred sire, and—although the pedigree could not be traced—believed to be pure thoroughbred on both sides, was ɜted. This mare was mated with the above-mentioned b, and the filly foal thus obtained grew into a nice smart e, but without much bone and with a slight likeness of her s hind action. Her height did not exceed 14 hands, but as was deficient in substance the Welsh pony cross was next l. The result was an exceedingly well-made filly, measur- at two years old 13·2 hands, having nice shoulders and hand, good deep body, and sound flat legs. With the ı of pony blood to correct the disposition to grow over ht, she should breed well when put to a thoroughbred sire. next foal, another filly by the hunter-bred sire above ded to, is a specially nice one, but has every appearance at teen months old of growing over the legitimate height. If, ever, when the time comes, she is mated with a small sized b or Barb, I have every reason to think the result will be ɜfactory. Supposing it were not, I should fall back upon a y sire, about 13·3 hands, whose breeding I was sure of for ɜral generations. This affords an example of how useful the ll pony class under 13·3 hands may be.

AS TO THE HEIGHT.

he chief difficulty, as I said before, in breeding polo ponies ound in keeping the best animals within the regulation ;ht, which has now been definitely fixed at 14·2 hands. v that the standard has been materially raised, the most ıable ponies more nearly approach the appearance of horses, many show little pony type at all, in fact *are* horses to ntents and purposes. There is a far greater difference than ɜe who have not studied the question can imagine, between ony of 14 hands and 14·2. When the height for match ies was 14 hands, those from 13·1 to 13·3 had a fairly good ace of holding their own in the game, provided they were le on the correct lines, and were of good breeding. Now, ·ever, these smaller ponies have no chance at all; by sheer ght those of the maximum height bear them down, and in ; of "riding out," or accidental collision, either force them of the game or knock them off their legs. The demand ›ng polo players for this smaller class of ponies has there- proportionately decreased, as also any encouragement for ɜders to produce them for this market. It is a matter of the ıtest importance, and one that the Polo Pony Society has at present time under serious consideration, how breeders may ; be helped under these circumstances. It will be a very ıt loss if there are no small ponies of the *polo pony type* to ɜd back to, as this is the only way to correct the tendency of the

rger mares to throw produce over height. The establishment
t the various Shows of classes for riding ponies not exceeding
3·3, to be judged on polo pony lines, would be of great assist-
nce in the furtherance of the object in view. The rules for
udging these ponies should be distinctly stated, and full in-
truction given to the Judges, or the serious mistake may be
nade of judging them as polo ponies *suitable for playing the*
ame. Polo players are frequently appointed to act as Judges
n these occasions, and none know better the animal most
uited for their requirements. It should, however, be always
emembered that a 13·3 pony class is not for ponies suitable for
laying the game, and so such ponies need not be tried with
tick and ball—as polo ponies should be—but as riding ponies,
n fact, as miniature polo ponies. Such ponies are valuable for
arrying boys and girls, and for light harness work, so many
eople now preferring to drive smart blood ponies instead of
he high stepping hackney type of animal. Before a distinct
reed of polo ponies is established it will be seen how necessary
13·3 stallions are for the larger mares, and what valuable dams
re ponies of the same height to cross with full sized blood or
Eastern sires.

CONCLUSION.

At present there is no *certain* road to success in fixing a type of polo pony so as to ensure that "like will beget like," but much has been done in the last few years to throw light upon the subject. Assisted by the support of the Agricultural Societies, the Polo Clubs, and the horse-loving public, a new industry is being opened up. Wealthy amateurs, and those landlords who wish to benefit their tenants by encouraging the breeding of high class riding ponies in districts suitable for the purpose, should form a stud from the best polo pony mare of good breeding. The owners of the small British breeds, by following the practice above described, may breed up to the highest standard of the polo pony, and, at the same time, greatly improve the ponies in their immediate districts. On ome farms, which are unsuited to the breeding of Shire horses or hunters, ponies may be reared with advantage, and the great nd growing demand for polo ponies of the stamp I have ndeavoured to describe should induce those who have the pportunity to take advantage of this new market.

IV.—*The Composition and Agricultural Value of Couch and Couch Ashes.* By JOHN HUGHES, F.I.C.

COUCH-GRASS (*Triticum repens*) is generally regarded by practical farmers as a most objectionable weed, possessing great vitality and very difficult to eradicate. Its peculiar trailing stem or whip-cord roots are capable of penetrating light porous soils with great rapidity, and if neglected will spread themselves over the whole field, rendering it foul, and smothering all kinds of cereal crops as well as fine grass. The trailing stems possess the power of developing both roots and buds, and it is useless to attempt to destroy the plant by chopping the stem into pieces; for this is in reality only multiplying it; hence, the grubber or cultivator is more effectual in bringing it to the surface than the plough, which only cuts and buries it again in the soil. It is not found on stiff soils, for the simple reason that the hard impervious clay prevents the passage of the characteristic roots, which flourish only on naturally porous, sandy, or calcareous soils.

Though usually regarded as a rank weed, the underground shoots of this plant constitute a peculiarly nutritious food for cattle; and if the cost of labour would admit of the removal by washing of dirt and soil always associated with them, they would furnish a new, and in certain seasons, a very welcome additional food for home consumption, especially for dairy stock.

The usual plan adopted to clean the land of couch is first to get it to the surface and then to burn it. Frequently, however, the weather will not admit of burning, and the farmer, being anxious to get his corn sown, cannot wait till the couch is dry enough to burn, and he therefore carts it away to the side of the field, where in a large heap the collected weeds are allowed to rot and decay, with the possibility of making use of the compost as a future dressing for the grass meadows. Many farmers, indeed, contend that this latter plan, though perhaps the most expensive, is generally applicable during wet seasons, and that the compost if returned to the soil furnishes a more complete dressing than the couch ashes alone would supply. In fact, the reputed manurial value of couch ashes is not believed in by such farmers, and they therefore do not trouble to wait till the couch is sufficiently dry to burn, but collect and cart it off at once.

With a view of ascertaining to what extent, according to the soil and time of year, the quality of couch varied in composition, and also of comparing the chemical constituents of the ashes (resulting from portions of couch carefully burnt in the laboratory), specimens of couch, and samples of the soil which produced them, were obtained from four farms situated in three counties of England.

., Aug. 5th, 1895, from Mr. J. H. Coleman, Horton, Epsom, Surrey.
!, Sept. 14th, 1895, from Beltinge Bay, near Herne Bay, Kent.
, Sept. 17th, 1895, from Mr. James Morris, Chivers Hall, Ongar, Essex.
, May 11th, 1896, from Mr. Alfred Lomas, Langford Hall, Maldon, Essex.

samples were as far as possible freed from adhering soil, dried by exposure to the air, and prepared for analysis usual way.

original samples as received at the laboratory contained lowing proportions of water :—

No. 1 specimen 41·02 per cent.
No. 2 „ 40·21 „
No. 3 „ 57·13 „
No. 4 „ 20·96 „

results of the analyses were as follows :—

COMPOSITION OF COUCH AS A FEEDING MATERIAL.

—	1 Surrey.	2 Kent.	3 Essex.	4 Essex.
lost at 212° F.)	7·70	10·10	7·13	10·06
Ether extract	2·16	·90	1·56	·94
noids	2·84	4·68	6·89	9·68
ble fibre .. .. go and Sugar..	61·61	57·73	50·06	42·80
tible woody fibre	16·16	20·63	23·53	23·89
l matters (Ash)	9·53	5·96	10·83	12·63
	100·00	100·00	100·00	100·00
ning Nitrogen	·45	·74	1·09	1·53
ning Sand	7·50	2·66	6·32	8·11
ater extract	35·80	31·20	27·01	14·67

e only objection to the above as a feeding material is the ity of sand, due to the soil which adhered to the couch. By ing, it was found possible to reduce the total mineral matter 5 per cent., so that where labour is cheap and a stream of ng water available, there is no reason why, in times of ity, an apparently useless weed should not be converted into uable feeding material for young stock and dairy animals. will be borne in mind that it was the underground portion couch, the whip-cord roots, not the surface grass, that was ted and analysed.

e proportions of albuminoids vary from 2·84 per cent. in gathered in August to 9·68 in No. 4 gathered in May. ge meadow hay, with about 15 per cent. of water, contains 9 per cent. of albuminoids and 27 per cent. woody fibre, it specimen 4, with only 23·89 of indigestible woody fibre, compares very favourably with ordinary meadow hay, and would be more digestible. The total nitrogen has been calculated into albuminoids for the sake of ready comparison with other foods; but it is probable that only a portion exists in that form, and that the proportions vary with the period of growth. The soluble cold water extract, which is always a good indication of the digestibility of a food, varies, it will be noticed, inversely with the figures for the so-called albuminoids—thus, there is as much as 35·80 per cent. in No. 1, and only 14·67 in No. 4.

If these couch roots could be cheaply separated from the soil and dirt, there is no doubt but that they would furnish a very useful food; further investigation as to the best time for collecting the same would therefore be very desirable.

I will now proceed to consider the composition of the ashes left after burning in the laboratory average samples of the four specimens of couch roots.

There was considerable difficulty in removing the adhering soil and in obtaining specimens equally free from dirt, and consequently the percentage of insoluble siliceous matters varied with the samples and affects the agricultural value of the resulting ashes. The results are tabulated in regular order, and the relative manurial value of each has been appended with a view of showing the practical use of the analyses:—

COMPOSITION OF COUCH ASHES.

—	1 Surrey.	2 Kent.	3 Essex.	4 Essex.
Potash	1·97	20·22	11·82	10·12
Soda	·19	1·34	1·49	1·74
Lime	·71	3·66	2·94	2·10
Magnesia	·19	·25	·24	·19
Oxides of Iron	3·36	3·90	4·16	3·40
Alumina	2·31	4·99	7·27	4·85
*Phosphoric Acid	1·29	6·62	4·10	4·23
Sulphuric Acid	·46	1·71	1·68	1·61
Carbonic Acid	·20	·86	·35	·13
Chlorine	·14	3·30	1·74	1·72
Soluble Silica (in Alkali)	9·45	18·90	20·30	14·96
Sand and Insoluble Silicates	78·98	33·90	43·66	54·38
Carbon and Undetermined	·75	·35	·25	·57
	100·00	100·00	100·00	100 00
*Equal to Tribasic Phosphate of Lime	2·81	14·45	8·95	9·23
	s. d.	£ s. d.	£ s. d.	£ s. d.
Relative manurial value per ton	10 6	4 15 0	2 16 0	2 10 0

m the above results it will be seen that the composition ch ashes varies very considerably, even when the roots rst freed as much as possible from dirt, and then carefully d in the laboratory.

e relative manurial value of the four samples has been d at by assuming that every unit of potash was worth nd that every unit of phosphate of lime, as finely powdered ble phosphate, was worth 1*s.* The value varies from *d.* to as much as 4*l.* 15*s.* per ton, and it is not therefore ising that the rough ashes, obtained naturally in the by burning in the ordinary way with the soil adhering, vary in manurial value to a still greater extent, and armers have substantial reasons for difference of opinion regard to the fertilising effects of couch ashes in different ities.

examination of the analyses themselves is quite sufficient ow that, apart from the differences caused by the presence ore or less earthy matter in the form of adhering soil, the ion of potash to phosphoric acid, lime, and soda varies as ws :—

——	Potash.	Phosphoric Acid.	Lime.	Soda.
in—				
1	1 is associated with	·65	·36	·09
2	1 " "	·32	·18	·06
3	1 " "	·34	·25	·12
4	1 " "	·41	·20	·17

obably the specimens of couch represented different varieties e plant, and accordingly the mineral or inorganic portion d in composition in the same manner as the organic on was found to vary in composition and in feeding erties. The time of the year must have had something to ith the composition of these roots; thus, No. 1 was gathered ugust 5th, 1895, No. 2 on September 14th, 1895, No. 3 eptember 17th, 1895, and No. 4 on May 11th, 1896. It ws that couch ashes will vary according to the variety of lant, the time of year, the season, and doubtless also with haracter of the soil.

the following table the chemical composition of the four which produced the respective specimens of couch are fully ted upon. These details afford interesting information with regard to the respective richness of the soils in the various elementary constituents of plant food, and the extent to which the most important mineral elements, such as potash and phosphoric acid, may be considered to exist in an available form:—

ANALYSES OF THE SOILS FROM WHICH THE SPECIMENS OF COUCH WERE OBTAINED.

—	1 Surrey.	2 Kent.	3 Essex.	4 Essex.
Water (lost at 212° F.)	·580	2·660	2·760	1·960
*Organic matter and combined water	3·241	6·638	5·884	4·692
Oxide of Iron	1·875	3·123	3·748	2·320
Alumina	1·210	2·577	3·092	1·460
Lime	·504	·593	1·041	·369
Magnesia	·144	·237	·269	·144
Potash	·142	·362	·301	·212
Soda	trace	·046	·106	·012
Phosphoric Acid	·115	·140	·179	·120
Sulphuric Acid	·027	·010	·008	·048
Carbonic Acid	·400	·227	·727	·080
Chlorine	·002	·007	·005	·003
Silica soluble in 10 per cent. Alkali	6·340	12·800	11·640	7·000
Insoluble Silicates	85·420	70·580	70·240	81·580
	100·000	100·000	100·000	100·000
*Containing Nitrogen	·160	·190	·209	·180
Total Potash (by fusion) ..	1·215	1·830	1·980	1·580
Total Soda	·206	·580	·670	·790
Soluble in 1 per cent. solution of Citric Acid (Dyer's process)—				
Available Potash	·021	·058	·033	
Available Phosphoric Acid	·009	·014	·019	

From the above results it will be seen that these four soils may be regarded as light loams.

When treated with the usual hot solution of half hydrochloric acid and half water, the combined amount of oxides of iron and alumina dissolved out varied from 3·08 per cent. in No. 1 to 6·84 per cent. in No. 3, while No. 4 contained 3·78, and No. 2 5·70. The figures for silica soluble in alkali (of 10 per cent. strength) varied in a corresponding manner.

The soils are all naturally porous, and just those in which would be likely to flourish, and, if allowed, to spread :eadily.

is interesting to notice that No. 1 soil is the poorest in h, phosphoric acid, and lime, as well as in nitrogen. No. 4 s next, but the proportion of lime is less, only ·369 as st ·504 in No. 1. Soil No. 3 is much richer in potash, phoric acid, lime, and nitrogen than either No. 1 or No. 4. y, No. 2 from Kent is still richer in potash, though the es for lime, phosphoric acid, and nitrogen are somewhat

hen we come to examine to what extent potash and phoric acid may be considered to be present in a form y to be available to the growing crop as determined by · solubility in a 1 per cent. solution of citric (vegetable) (the process suggested by Dr. Dyer), we find that practically esponding relative results are obtained:—

—	No. 1.	No. 2.	No. 3.
sh by usual process (soluble in ydrochloric Acid)	·142	·362	·301
sh available (soluble in Citric cid)	·021	·058	·033
phoric Acid by usual process oluble in Hydrochloric Acid) ..	·115	·140	·179
sphoric Acid available (soluble Citric Acid)	·009	·014	·019

o comparison with the figures in No. 4 could be made, as quantity of soil sent was insufficient to admit of treatment he new process.

t will be noticed that there is a uniform relationship veen the potash and phosphoric acid soluble in hydrochloric and the corresponding amount soluble in a 1 per cent. ition of citric acid, and it is therefore evident that the *usual* cess, if carefully performed, is capable of affording very ible information as to the relative fertility of different s.

he total potash which the soils contained was determined fusion in all four samples, and the figures are interesting for poses of comparison. Thus it will be seen that soil 3 from ex contained the most potash, but that soil 2 from Kent is ctically almost as rich in this respect. Soil 4 from Essex ies next in richness in potash, and soil 1 from Surrey is the rest, as also it is the poorest in soda.

COUCH CARTED OFF TO THE SIDE OF THE FIELD.

At the commencement of this paper it was stated that frequently the weather would not admit of burning the couch, and that the farmer, being anxious to sow his corn or root crop, is compelled to cart it to the side of the field, where in a large heap the couch and adhering soil are allowed to decay as a compost; but in many cases this deposit is not carted on to the fields for years afterwards. In order to ascertain the composition of such a compost, the following analysis of a sample, drawn from a heap put up on the farm of Mr. J. H. Coleman, near Epsom, in August, 1895, was made in April, 1897, with the following results:—

COUCH AND SOIL CARTED TO A HEAP AUGUST, 1895.—ANALYSED APRIL 13TH, 1897.

Water (lost at 212° F.)	1·620
*Organic Matter and Combined Water	5·288
Protoxide of Iron	1·440
Peroxide of Iron	·690
Alumina	1·000
Lime	1·635
Magnesia	·151
Potash	·181
Soda	·018
Phosphoric Acid	·128
Sulphuric Acid	·041
Carbonic Acid	1·060
Chlorine	·008
Silica soluble in Alkali	4·820
Insoluble Silicates	81·920
	100·000
*Containing Nitrogen	·215
Coarse Sand separated by washing	66·840
Total Potash (by fusion)	1·100
Total Soda ,,	·402
Available Potash (Dyer's process)	·051
Available Phosphoric Acid	·026

On comparing these results with the analysis of soil 1, which was taken from the same locality on the same farm, it will be seen that the organic matter is higher, 5·288 against 3·241 in the original soil, and that the nitrogen is also higher, ·215 against ·160. The potash determined as usual is also somewhat higher, ·181 against ·142, and the potash probably available is ·051 against ·021. The phosphoric acid determined as usual is ·128 against ·115, and phosphoric acid probably available is ·026 as iinst ·009. Lastly, the lime is 1·635 against ·504. It is eresting to notice that the increased quantity of phosphoric d and of potash exists in an available form, that is to say, uble in a 1 per cent. solution of citric acid, thus affording an istration of the value of Dr. Dyer's process for special rposes. In fact, this compost is in every respect decidedly her than the original soil, for although the increases referred are only in decimal places, it should be remembered that in ind numbers every ·10 per cent. in a soil analysis represents on per acre to the depth of six inches. In other words, that increase of ·10, say, in phosphoric acid, nitrogen, or potash, ans an increase of 1 ton per acre in these important elements plant food. Consequently this decayed compost would be a itable dressing for putting on the field from which it was ginally taken; but it would not be of sufficient value to cart y distance, for it is nothing more than soil enriched by the ments of the decayed couch.

In comparing the two methods of cleaning the land of couch, mely—burning on the spot and carting to the side of the ld—there can scarcely be any doubt that the former is both most economical as well as the most effectual treatment. burning, the couch is killed and the mineral elements which istitute the ashes are rendered immediately available as plant d for the future crop. The only immediate loss consists in nitrogenous or organic portion which is consumed and olved into gaseous products that are, however, subject to absorption in due course, so that even these are not really lost agricultural purposes, though the locality of their availability naturally largely extended.

It has been pointed out as the result of several analyses that ashes derived from the burning of couch vary considerably cording to the composition of the soil, so that the richer the l the better the ashes. Further, that couch itself varies very isiderably in composition, according to the particular variety, composition of the soil, and the time of the year at which it analysed.

These are all important factors and materially help us to m the opinion that couch and couch ashes vary very much in ir composition, and consequently in their agricultural value, that farmers in different districts may rightly regard them in ferent degrees.

As a feeding material during times of scarcity, couch, pro- rly cleaned and freed from adhering dirt, should certainly ve useful. The following is an analysis of a carefully aned and personally selected sample of the well-known ipcord-like roots of couch from a farm in Surrey.

uch Roots collected April 23rd, 1897, from Mr. J. H. Coleman's Farm, Epsom, Surrey.

Water (lost at 212° F.)	15·30
Oil and Ether extract	·26
*Albuminous compounds	7·15
Sugar, Glucose, Mucilage, and Digestible fibre	54·80
Indigestible woody fibre	18·26
†Mineral matters (Ash)	4·23
	100·00
*Containing Nitrogen	1·13
†Containing Sand	1·73
Cold water extract	34·80

will be observed that with 15·30 per cent. of water this lly dried and finely ground couch contained 7·15 per cent. rogen compounds, and more than one-third of its weight ely, 34·80 per cent.) of soluble feeding constituents, sting of mucilage, sugar, glucose, and similar easily ed materials.

e powdered substance, moreover, possessed a particularly nt aromatic odour, which would naturally enhance its for feeding purposes, so that if couch could be obtained reasonable cost in a dry and fairly clean condition the r would find it very useful for his stock, instead of its regarded as a most objectionable weed.

Observations upon the Recess Committee's Report on the tablishment of a Department of Agriculture and Industries Ireland. By C. T. D. ACLAND.

SCOPE AND METHOD OF THE INQUIRY.

ay perhaps seem a little strange at first sight that a review e Report of a Committee of Irishmen acting together in the ests of Ireland should find a place in the Journal of an ish Agricultural Society. But the fact that within the s of that Report is to be found a considerable amount nteresting information upon the subject of agricultural nisation and State aid to agriculture in European tries, may be a sufficient justification for such an insertion. r. Horace Plunkett, M.P., an Irish Unionist, had the good ne to be able to enlist the co-operation of twenty-two lemen of various creeds and political opinions in an effort o formulate a series of practical suggestions for the improvement, griculturally and industrially, of their countrymen and the sland which they all so dearly love.

After an Inquiry, which embraced within its scope the practice nd institutions connected with agriculture and rural industries n nine different foreign countries, these gentlemen arrived nanimously at certain conclusions which are embodied in heir Report.

These conclusions, having of course special and direct eference only to Irish agriculture and Irish industries, are not f actual immediate interest to the English agricultural reader.

Special Commissioners were, however, sent to each of the ollowing countries:—France, Belgium, Holland, Denmark, Bavaria, Wurtemburg, Austria, Hungary, and Switzerland, on the ground that these countries not long ago were in a similarly depressed condition as regards agriculture and industries, and that in each of them there has been a revival from which lessons might be learnt for Ireland.

These Commissioners were specially instructed to study the part played by the Government in each case with regard to the initiation and maintenance of that revival.

From these Reports on foreign countries, with which over two hundred pages of appendices to the Report are filled, there may be gleaned a good deal which may prove useful and suggestive with regard to our own agriculture and the cognate industries affecting our agricultural and rural population.

RESULT OF EDUCATIONAL NEGLECT.

In passing over without detail that portion of the Report of the Commissioners which deals specially with Ireland, it may be well to note the unanimous opinion recorded that one of the main causes of the backwardness of Ireland in agriculture has been the neglect (it is even, indeed, described as the discouragement) of practical and educational training in agriculture which it was in 1848 proposed to establish in connection with the primary schools in Ireland.

One may well believe that had the system been adopted, and, as must have been the case, improved by experience during the last half century, its results might have been not only appreciable agriculturally, but fruitful of most beneficial and important results, socially and politically. As has been proved by the course of events, the operation of the cause mentioned above has been the ousting, in a great degree, from the English markets of Irish butter and bacon. These, which used to hold so high a place, have now given way before the invasion of the produce from Denmark, France, Sweden, Belgium, and Germany, where the training of the agricultural population has been followed by its natural result.

COTTAGE INDUSTRIES.

Those of our readers who have interested themselves in the attempts made in England of recent years, partly in connection with the Technical Education Movement, to resuscitate and develope cottage industries in rural districts as a means of providing attractive and remunerative employment which might keep the rural population from crowding into the towns, will be encouraged in their efforts by the statement that there are in the province of Moscow alone forty-three different categories of cottage industries, each of them covering at least a dozen trades, and that for these industries of Russia, Bavaria, Bohemia, Wurtemburg, Switzerland, and the Austrian Tyrol, the chief market is in Great Britain and Ireland. The value of these minor industries of the Russian peasants is stated to amount to 5,000,000*l.* a year, that of their hand-loom weaving to 2,500,000*l.*

ORGANISATION, REPRESENTATION, EDUCATION.

In the third part of their Report (which it must not be forgotten was the unanimous expression of opinion of twenty-three persons differing widely in circumstances and associations), the Committee, dealing with the promotion of agriculture and industry abroad, use these remarkable words :—

> Various though the circumstances of these different countries are, it is a striking fact that we find the same main principles adopted by them all in promoting agriculture. Three great principles, which are common to all, may be summed up in three words—*Organisation, Representation, Education.* That is to say : organisation of the agricultural classes themselves in societies, clubs, or corporate bodies, for the advancement of the various branches of their industry; representation of the opinion of the farming classes in the administration of State aid by Government Departments; and education of the farming classes, both adults and children, in all technical knowledge appertaining to their industry.
>
> The organisation of the farming class follows in all these countries, with little variation, similar lines. There are, first of all, what we would understand as "Farming Societies," which are variously called abroad "Agricultural Clubs," "Chambers of Agriculture," or "Agricultural Societies." These are spread through nearly every district, corresponding to our county districts. They are federated in provincial societies, and these provincial societies are federated in great national unions. The State almost invariably grants subventions to these Societies. It delegates to them a large portion of the administrative work of its Agricultural Department, and sometimes, as in Denmark, it delegates that work almost in its entirety. . . .
>
> Completeness and thoroughness of organisation amongst the agricultural

class effects three great purposes, educational, industrial, and moral. It is the most efficient means for spreading enlightened and new ideas amongst the farmers. By combination, and by meeting together to exchange views, they are enabled to grasp in the shortest time, and make the quickest use of, all information supplied them, through the agency of the State or otherwise; they are able to apply, by combination, resources of capital and skill to their industry which would be beyond their reach as individuals; and, finally, their spirit of self-reliance and mutual good-will is preserved, and they are saved from the error of relying too much upon the State, and relying too little upon themselves and their neighbours. . . .

We find that the universal experience of European countries confirms amply what M. Tisserand again and again repeats in the valuable Memorandum which he has so courteously prepared for us: that a fundamental principle of all State Departments of Agriculture ought to be "to awaken the spirit of initiative and independence, and stimulate and develop it amongst the agriculturists themselves," to "stimulate and aid voluntary associations and institutions of the agricultural classes," and to "sustain amongst the rural population the spirit of self-help."

It is no doubt true that we have in England no lack of Agricultural Societies. But no one, I think, would say that mutual self-help and reluctance to rely too much upon the State are characteristic of the English farmer. Nor is it at present true that the State utilises the Agricultural Societies or, to any large extent, promotes organisation or combination among agriculturists.

Every one of the agricultural departments in the countries under consideration in this Report, except those of Denmark and Hungary, is provided with a Consultative Council, which is a representative (to some extent actually elective) body of agriculturists or scientific men interested in agriculture. These Councils are in direct legal relation to the Minister for Agriculture. In some countries definite Technical Committees of specialists are appointed to assist the Minister in each branch of administration.

AGRICULTURAL EDUCATION ABROAD.

But "the most positive action of the State in assisting agriculture is taken in connection with education. Everywhere it is accepted as an axiom that technical knowledge and general enlightenment of the agricultural class are the most valuable of all levers of progress." And with regard to the various systems the most striking point is the great similarity in their main features.

Almost everywhere there is a course of elementary practical instruction in agriculture given in the primary schools; there is a class of secondary schools in which a more extensive course is given to boys of from thirteen to sixteen or seventeen; and there is a system of higher training for the sons of large landowners and those intended to be managers of large estates, agricultural

> eers, and professors and teachers of agriculture. Most countries, more- have adopted a system of travelling instructors or professors, who not superintend the agricultural courses given in the primary schools of their cts, but also hold conferences and give lectures, and advise, and keep selves closely in touch with the actual cultivators of the land. Agri- ral schools for the farmers' daughters, in which they are taught what is l in France the lore of the farmyard and farmhouse, including the ig of poultry, the feeding and tending of live stock, cooking, domestic my, and the keeping of farm accounts, are also to be found now in most se countries.
>
> ample plots, under the care of the travelling instructors, in which the s of scientific tillage are illustrated for the benefit both of the cultivators he pupils of the primary schools are generally kept up in each locality; the State maintains experiment stations where seeds and manures are sed, and researches are conducted by agricultural scientists. Denmark staff of experts residing abroad to watch the interests of her staple ultural exports, and to advise the farmers as to the varying requirements ie market; and France has begun to appoint for a similar purpose ultural Attachés to her Embassies.

ut not less important are two other features—

> o other features common to agricultural education abroad are (1) a calling lay of local contribution, supervision, and responsibility in the support nanagement of the schools, and (2) the elasticity with which the course struction is made to adapt itself to the particular characteristics of the ties in which the different schools are situated. Thus we see that in the of the *Écoles pratiques* of France—the now most approved type of dary agricultural schools—the local authority (whether it be the ty Council, the Commune, private individuals, or a religious order) supply the buildings intended for the school, and the farm to be worked nection with it, and must undertake all responsibility for its manage- , while the State confines itself to paying a certain proportion of the ers, and to inspecting the school and contributing certain bursaries. local authority and agricultural associations are expected and encouraged o contribute bursaries or scholarships, and the latter bodies are stimu- by the Government to continue the practice, already adopted by them, ving rewards to competent teachers and prizes to meritorious pupils. members, too, are urged to make a habit of visiting the schools per- ly, and to take an active interest in their work. . . .
>
> the case of technical education, at any rate, as applied both to agricul- and industries, elasticity and variety are the rule. In France, for ple, both in the Primary and in the Practical Schools, the course of ing is varied according to the special requirements of the locality, and ourse is fixed by the local management in connection with the travelling ssors and State inspectors. Even in the great Regional or High Schools griculture, the same adaptation of teaching to the circumstances of the ty prevails. The system in France in these respects is adopted through- he Continent generally.

STATE PROMOTION OF INDUSTRIES.

n the subject of the Promotion of Industries, the following graphs of the unanimous Report deserve attention :—

> te assistance in the case of industries is a much more difficult matter in the case of agriculture. When Government steps outside the broad

ines of facilitating and cheapening means of transit, and developing banking facilities, it is in danger of entering regions sacred to private enterprise. Even in the matter of technical education it treads on dangerous ground, and t is liable to be attacked from certain quarters if it ventures to teach trades. That these difficulties can, however, be overcome without doing too much violence to the most cherished principles of political economy, the experience of the Continent proves conclusively. One of the industrial phenomena of he last forty years has been the immense growth of manufacturing industry n Continental countries, largely at the expense of British trade; and that growth seems to be directly traceable to the assistance given by the State n these countries, by technical education and otherwise, to industrial enterprise. . . .

Outside the technical instruction which is involved in the introduction of special industries, and which consist mainly in the direct teaching of handicrafts, there lies the field of technical education properly so called. The direct teaching of handicrafts is a phase, the necessity for which passes away in time as the industries introduced attain to an established character, and produce a class of handicraftsmen who can furnish the necessary special instruction to apprentices in the workshop or to the members of their families. Technical education proper has for its object the furnishing of the industrial classes of all degrees with the foundations of that scientific and artistic knowledge which is necessary for a theoretical understanding of their future callings, and with that manual training which gives them the dexterous use of their hands, so that they enter the workshop possessed of a high degree of manual skill, which is adaptable at once with a little experience to whatever special branch of industry they pursue. *Throughout the entire Continent we find that these general principles are the same, and we may say at once that they are at variance with some of the leading theories of technical instruction adopted by the Science and Art Department in Great Britain and Ireland.*

"Decentralisation, the free play of local individuality, and direct relationship with local industries are the keynotes of technical training throughout the Continent." . . . "Small towns are better starting-points for Industrial Education than capitals."

RECOMMENDATIONS.

In applying their conclusions to the case of Ireland, the Committee recommend Travelling Instructors for separate districts, Example Plots for each rural parish, Experiment Stations and Analytical Laboratories, Practical Schools for girls as well as boys, and Conferences for farmers' wives upon those subjects with which they are specially concerned—thus showing their recognition of the fact that in housekeeping, cookery, and nursing there is much that can be usefully taught in the interests of economy, health, and good management.

RESULTS OF INQUIRIES ABROAD.

But, as has been said above, the chief interest of the volume to English agricultural readers will be found in the accounts of the results of their inquiries in foreign countries by the Special Commissioners. No apology need therefore be made for giving a few extracts containing the most noticeable points reported.

France and Denmark are reported upon by Mr. Thomas P. Gill, and a valuable memorandum is added by Monsieur Tisserand, Director of Agriculture in France.

The following extracts seem worthy of the notice and attention of English agriculturists:—

> There is *one fact specially to be noted* in the agricultural development of both France and Denmark, countries which, though differing widely in most other respects, are the two most advanced and (speaking proportionately) the two wealthiest agricultural countries of the Continent. That fact is the *close dependence of the State*, in what it does to assist agriculture, *upon the co-operation of voluntary associations of the agricultural classes.*
>
> It is everywhere being discovered that an agricultural department, to be thoroughly successful, must not be suspended in the air, as it were, above the heads of the people, but must have a system of voluntary representative associations of agriculturists to receive, distribute, and apply the various forms of assistance, and that it must be in constant touch with, inspired by, and to some extent even directed and controlled by, the representative organs of agricultural opinion.

DENMARK.

The trade in butter, eggs, and bacon is a recent development in Denmark, the trade in butter having grown up only within the past twenty years, that in bacon only within the past eight years. When the fall in prices of corn began, the Danish farmers, acting upon the advice of their experts and being in a position to avail themselves of that advice by means of their organisation, gradually gave up corn growing and went instead into dairy farming and cattle raising, thus utilising the cheap imported corn as "raw material" in the shape of fodder for their dairy and export stock. This is a most interesting instance of an agricultural country, instead of suffering from free trade, utilising it as a means of advancing its principal industry. Again, when swine-fever decimated their export of living swine, they started co-operative bacon-curing factories, the capital for which they raised on the system of co-operative credit; and in eight years the export of bacon rose from nothing, to what represented upwards of a million and a quarter of swine in 1895.

The Royal Agricultural Society of Denmark is in touch with, and acts as the Intelligence Department for, the vast body of co-operative societies, by which the business of agriculture in Denmark is now almost entirely carried on. These Societies may be classified thus:—

(*a.*) Co-operative Societies for the breeding and rearing of Cattle, Horses, and Pigs.

(*b.*) Co-operative Dairy Societies (one in every parish).

(*c.*) Co-operative Bacon-curing or Swine-slaughtering Societies.
(*d.*) Co-operative Egg-collecting and Exporting Societies.
(*e.*) Co-operative Bee-keeping Societies.
(*f.*) Co-operative Fruit-gardening and Horticultural Societies.

A special feature of the methods of the Danish Government in assisting agriculture is the employment of agricultural experts of good educational standing, whose advice is given free. They conduct experiments, investigate and give advice in cases of failure or misfortune, act as judges in trials and Shows of implements and stock, buy stock for Societies and for the Government, watch foreign markets and the legislation restrictions, &c., of other countries, and visit these countries to acquire knowledge of improvements and extend Danish trade.

The Danish Government gives a subvention to each of the local Agricultural Societies Shows equal in amount to the subscription raised for the purpose of the Show by the Society. County Councils give prizes at them. The Government also encourages the superior cultivation of small holdings and labourers' allotments. Prizes are sometimes given in the shape of loans for special purposes, the loans being remitted after three years if the object has been satisfactorily carried out and worthily maintained. Sometimes the prizes are travelling grants, including the cost of fare and a small subsistence allowance. Such grants are also made to dairy managers and dairywomen, and such persons as, e.g. the manager of a bacon-curing factory.

There are also subsidies to steamships and Railway Companies (these, of course, tend to lower railway rates).

FRANCE.

France is pre-eminently agricultural. She is the largest wheat grower in Europe. Nearly half her inhabitants are agricultural. The rural is double the urban population. She has nearly seven millions of cultivators, of which about half are proprietors or farmers, and of this half more than three millions (more than three-sevenths of the whole number) cultivate holdings of less than 50 acres.

Under these circumstances, it is not perhaps surprising that the development of agricultural education is the feature to which the attention of our readers can be most profitably turned. In 1870, the expenditure in France upon agricultural teaching amounted to 76,600*l.* In 1896, it cost 182,000*l.* Space does not permit allusion in detail to the higher class of institutions which have agricultural education for their object. It must, with regard to these, suffice to state that an institute was founded in 1876 for training the sons of the larger landowners, and for producing men of science well trained for agricultural study and research. In twenty years, about 600 pupils have graduated from this institute, of whom nearly half are now agriculturists, the remainder being chiefly engaged in teaching or superintendence. Besides this Institute, there are Schools for veterinary, dairy, poultry, forestry and horticultural work, and for horse-breeding. From the Horticultural School at Versailles over 700 gardeners have been produced in twenty-three years.

But most important are the Farm Schools. These are for the benefit of the French peasantry. The pupils enter them on leaving the primary school, i.e. at twelve or fourteen years of age. The first was founded in 1872, with the aid of the County Council of the Meuse. There are now forty of them, and the number is still increasing. The locality or a private owner has to find the local requirements, premises, and equipment. The State only supplies the cost of the teaching and directing staff and some scholarships for the poorer students, which may amount in all to some 700*l.* or 800*l.* a year. The fees for boarders vary from 16*l.* to 20*l.* a year; half boarders 8*l.* or 10*l.*; day pupils 2*l.* a year. The County Councils provide scholarships also. The average total cost to the State is 800*l.* to 1,000*l.*, and the number of pupils about thirty. The practical instruction varies according to the district. The theoretical course is more uniform and very complete. These Schools are enthusiastically supported by the people, and many of the Schools have a chapel attached to them. In some the domestic work is taken charge of by Sisterhoods. There are also practical schools for girls of about fifteen years of age.

In addition to the above provision for agricultural instruction there is also the Institution of Travelling Professors. These had up to last year given instruction to 2,700 future teachers of rural children, and their lectures had been attended by upwards of 300,000 persons in about fifteen years.

Besides this remarkable activity in educational matters, there is another not less important element of agricultural prosperity to be noted in the thorough organisation which is manifested by the existence of upwards of 1,200 agricultural associations, and 2,200 co-operative cheese-making societies, and 1,500 Syndicats Agricole, which are in reality co-operative societies for credit, purchase, threshing, and harvesting, cattle-breeding (owning pure bred bulls, &c., collectively), and so forth. These various forms of voluntary local organisation are greatly encouraged by the Government, and doubtless tend strongly to invigorate agricultural effort, and to promote the adoption of new and fruitful leas. Would that one could see grounds to hope for some such evelopment in rural England where the word "co-operate" is ıostly heard with horror!

HOLLAND AND BELGIUM.

In the Reports upon Holland and Belgium, again, we find hat by far the most important results of State aid are those vhich follow the efforts made by way of assisted instruction ınd education. Winter schools, and in connection with them 'Wanderlehrers," or itinerent public teachers, experiment fields 'called by the Dutch "Proof-fields"), somewhat similar to Sir John Lawes's great work at Rothamsted, and a system of secondary schools, are among the most important features in these countries, where almost the whole prosperity depends upon agriculture, and where it might therefore have been supposed that farmers would think they knew their own business better than any one who would teach them. But an important part of their prosperity is also due to "co-operation and low railway rates." The Écoles ménagères, where girls are systematically taught thrifty and skilful housekeeping, marketing, and cookery, were established in Belgium in 1889, and so successfully that one is now attached to every female middle-class school in the kingdom. Girls leave them sufficiently well trained to be able to manage an hotel.

The establishment in a Belgian village of a "People's bank" (Raffeisen), on a system of co-operative credit in 1892, has resulted in the establishment of thirty-seven more within three years, and they are all flourishing at present. (Of these institutions there are in Germany some 10,000; in Hungary, 760; in France, 281.) Loans from these banks are at 3½ or 4 per cent., but cannot be made for purchase of house or land property, only for stock, implements, phosphates, or other farm expenses. The borrower must insure his life for the benefit of the bank, so that in the event of his death the farm may not be sold over the heads of the widow and children.

The impression which may already have been created upon the reader that in other countries agricultural education or special instruction forms a large part of the aid given by the State to agriculture, will be further strengthened when we turn to Wurtemberg, Switzerland, and Bavaria.

WURTEMBERG.

In Wurtemberg, one of the most famous agricultural schools in the world, dating from 1818, exists at Hohenheim, and, in addition, there are several winter schools for farmers' sons over fifteen years of age. The course lasts from November 1st to March 31st. The Government gives 90*l.* to each school. In the summer months the master becomes a Wanderlehrer, or peripatetic teacher.

In 1851, Dr. Steinbeis was so struck with the handicraft work of various nations that he said to himself, Why should not Wurtemberg do something like this in which brain and hand must work together. In the year 1853 he published his views

under the title, *Elements of Work Schools*, and King Wilhelm announced that the watchword of the new system was: "in order to make schools efficient, theory and practice must go hand-in-hand." This principle has been a magician's wand in transforming the kingdom of Wurtemberg, its success being described by Mr. Tyler, writing in 1882, as follows:—

> "Thirty years ago Würtemberg was in a deplorable condition. Since then, Dr. Steinbeis, by means of technical schools, local and central exhibitions, by training industrial teachers, by transplanting trades from other countries, has converted a population without mechanical knowledge into one carrying on most of the small trades practised in Europe. This has helped the agricultural interest very much, as it has provided a manufacturing population close to the farmer."

The practical wisdom of the founder of this system has been shown by the provision of a separate and distinct set of schools (Fach Schulen) for children of the working class, and another separate and distinct set for children of the employers (Fortbildungen Schulen), the curriculum in each class being adapted so as to make the best of the available years of instruction. But no child is admitted to either if under ten years old, or without having passed through the Volks-schule, or primary school. By means of these schools and the Raffeisen banks, Wurtemberg has been in less than half a century converted from a wretchedly poor country into a thriving hive of small but profitable industries, exporting largely to England, and the agricultural produce per acre is about 5 per cent. larger than in England. The average size of farms is under 20 acres.

SWITZERLAND.

In Switzerland, all the above institutions of Wurtemberg have their parallel. But there is no country that comes up to Switzerand in its efforts to instruct all classes of the people, the expenditure last year on schools reaching 1,575,000*l.*, or more than 0*s.* per inhabitant. Both the locality and the central authoty contribute to the cost of the schools, whether Winter Schools, Agricultural Schools, Veterinary Schools, or Dairy Schools: in other words, these institutions are largely main-ined out of the rates and taxes. Not only so, but the same sources are drawn upon for the improvement of land and ttle, and even to assist insurance. In Switzerland fourteen ars is the minimum age for apprenticeship, and all children ve to attend a higher school for three or four years after e elementary school. Co-operative dairies and savings' nks are here as important factors in agricultural prosperity elsewhere.

BAVARIA.

What has been said of Switzerland and Wurtemberg applies so to Bavaria. But perhaps the fact ought to be a little ore emphasised that unquestionably the agricultural proerity which is so marked in these countries is greatly prooted by the technical instruction of the people, both in atters specially agricultural and in other industries. Their everness, dexterity, and general intelligence being thus deveped, they become more valuable to the farmer. This acts as inducement to them to remain in rural districts, where they n maintain themselves in health and comfort, and are useful embers of the community.

HUNGARY.

In Hungary, the action of the Government is upon rather fferent lines. That is to say, that out of 970,000*l.* expended aid to agriculture, very nearly half, or 470,000*l.*, is given for e improvement of live stock. There are twenty-eight stud ations (Hara's), and there are 6,500 mares and stallions, some which have cost from 500*l.* to 1,500*l.* each.

At four State cattle-farms over 28,000 head, chiefly of bulls d pigs, are kept.

A large sum is likewise spent upon drainage, canals, replantg of vineyards, and the development of colonies of peasant oprietors, the Government purchasing large estates as they me into the market and selling them again in small lots on sy terms.

In 1895, an Agricultural Congress met at Buda Pesth, and ong the resolutions passed at it are to be found, in addition the advocacy of measures similar to those already described adopted in other countries, resolutions advocating the taking steps for distribution and supply of farm labour, the special nishment of drunkenness and encouragement of temperance, e spreading of co-operation, and the registration of land titles facilitate sale. Hungary was in advance of the rest of Europe the matter of agricultural schools. The first was established in 1779, and the famous Georgicon Academy, which was for a long period the model agricultural college of Europe, was founded in 1797. After fifty prosperous years it was suppressed on political grounds, a fate which befell many other similar institutions. Recently, however, several schools of agriculture have been started or reopened, and there were in 1896 thirty-nine such schools, of which fifteen are for the sons of peasants. Winter schools, of which the teachers are in the summer peripatetic, are as important in Hungary as in the countries already noticed.

AUSTRIA.

In Austria, of all the various forms of State aid which are to be found in the other countries, viz., education, land improvement, improvement of stock, Raffeisen banks, and co-operation, not one is to be found wanting. The Wanderlehrer, of whom there is a State staff of 314, each at a salary of about 170*l.* per annum, have been so successful that, in the last six years, their aggregate audiences have trebled, rising from 101,000 to 313,000, although the Provincial Diets have also other such teachers at work.

But the great lesson that Austria affords is the beneficent effects that are produced by technical schools. Twenty years ago such institutions were almost unknown, and to-day there are 1,300 scattered up and down through the various provinces, and exercising much influence for good in the rural population, both morally and materially. It has been said, with much truth, that "the system of school workshops inaugurated by the Austrian Government is the most complete in Europe."

CONCLUSION.

From lack of space, it has been necessary in this article to pass over, unnoticed, innumerable details of great and instructive interest. But it is impossible to close without the remark that no one could lay down the Report of the Recess Committee after anything more than a most cursory glance without feeling convinced of three things. First, that a great field lies open to us in the development of local industries which, by affording profitable and stimulating employment for the rural population, may help to solve the labour problem which is so serious for the farmer of the present day. Secondly, that if the Government would give a lead, or some practical encouragement, much at present unattempted could be accomplished in the way of co-operation and combination among agriculturists. Thirdly, that very much more than the English farmer has been hitherto willing to believe or, at any rate, to admit, can be done to further ress in agriculture by means of the spread both of education of instruction.

may be replied that the circumstances of European itries are so different from our own that their experience not apply to us; and that the English farmer knows his ness better than any one who tries to teach him. The inder from the agriculturist of any of the countries about ch reports have been furnished would be:—It is most fortu- e for us that such has not been the opinion of *our* farmers, if it had been, we should not have our present hold on the glish markets.

VI.—*Innovations in Cropping.* By W. W. GLENNY.

is important at the commencement of an article with the ve heading to disclaim any intention of advising the abandon- nt of rotations or systems. I would rather endeavour to istrate that, in certain cases, antiquated methods must be ixed, and rules of long standing may bear some variation. tations, which were valuable fifty years ago, are now dis- ered to be unworkable under changed conditions. Old farm toms have broken down and have given way, on account of ered circumstances.

Any departure from a regular course or rotation may be con- ered an innovation. An alteration of one root crop for other, for instance, need not break a rotation, but it may be a v divergence. But to lay down more than a defined proportion a farm with permanent pasture must interfere with any ation, though temporary pastures may be made to fall in ystem. The tendency of higher farming and greater variety crops is to give a better opportunity for thoroughly aning the land, and thus to lessen or abolish the necessity bare fallow.

More intelligent methods of arranging crops, and the advan- ges derived from chemical knowledge, remove the need of arge breadth of ground lying idle or vacant every year.

The alterations in our fiscal arrangements with other coun- es, combined with improved means of transport, have wrought at havoc with the trade in home-grown cereals. The centre gravity has been shifted, and many rules must be reconsidered d readjusted. Hence alterations in cropping are advisable. t, however, sudden and violent changes, for these often end in uble and disaster, but cautious and prudent experiments should first tried. Bacon expresses this aptly when he says, "He that will not apply new remedies must expect new evils, for time is the greatest innovator." * The crop of wheat can no longer be considered, as formerly, the main-stay or sheet-anchor of British agriculture. It is wise to consider whether other crops can partially take its place with advantage, so as not to put too much reliance on one venture.

Where the land is strong and heavy, and in consequence more suitable for wheat and beans than for any other crop, and unsuitable for breeding or rearing stock, the case is difficult to treat.

If good wheat land is sold in some counties at less than 6*l.* per acre something must be wrong, and it is necessary to investigate thoroughly all questions, whether direct or collateral, that may arise, all the details of tenure and management that may in any way bear on this important issue.

The recent sale of the Honywood estates at Great Totham, near Witham, Essex, in July, 1897, affords an apt illustration of the present value of this kind of land, where there are no exceptional advantages to enhance the price. In the case taken as an example, a tenant purchased three farms, one of which was in his own occupation at the time of the sale. The tithe is shown to make the picture more vivid: †—

—	—			Realised.	Tithe for 1897.		
	a.	r.	p.	£	£	s.	d.
Sheepcoates Farm	254	0	37	1,525	50	7	4
Jepcracks Farm	228	1	13	1,080	40	13	1
Chapel Farm	265	1	26	1,675	55	9	7
	747	3	36	4,280	146	10	0

In round figures, 748 acres of freehold land sold for 4,280*l.*, or about 5*l.* 14*s.* 5*d.* per acre. If the new landlord is satisfied with 2½ per cent. on his outlay, the result will work out, 3*s.* rent + 4*s.* tithe = 7*s.* per acre, for both charges. The land is at no great distance from a railway station, and is a useful and workable soil.

Whilst a possibility remains of securing freehold land in this country on such easy terms, it seems unnecessary for those who desire to attempt agriculture to risk their all in Manitoba or Argentina. Few tenants are able to secure their freehold farms on like favourable conditions. Either the owner is unable or unwilling to sell, or the tenant is unable from want of capital o purchase. We may consider that most of the land in this ountry is owned by one man and occupied by another. There s much of it where alternative crops may be attempted, where many expedients and devices may be tried, and a change of crop on a portion of the occupation might be profitable. In such cases, the greater the freedom conferred on the intelligent tenant, the better for all parties; the opportunity should be freely offered to him, to use all his wit and cunning in the cultivation of the soil. To curb him in the exercise of his judgment by antiquated or feudal customs carried down from the middle ages is vain, idle, and puerile.

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* Bacon's Essay on Innovations.

† See 'Essex County Standard,' July 31, 1897.

Frequently leases drawn by family lawyers, and which are literal copies of those in use many years ago, are placed before tenants. The original specimen having been in the pigeonholes of the agent's office for many generations, has become utterly unsuited to the state of affairs to-day. If the tenant is inexperienced he signs what is laid before him; if he understands his position he declines to pledge himself to any covenants that will unduly hamper his action and place him helplessly in leading strings. Possibly these stringent clauses may never be intended to be strictly construed, but if they are once included in a legal document, they may be used as a *brutem fulmen*, or by an imperious agent be actually enforced when least expected. If the tenant understands his business, and has capital and courage, the owner should give him as much liberty as practicable. All vexatious restrictions as to cropping should be abolished whenever he shows a knowledge of his art, and ingenuity in adapting himself to the changing conditions of the time. He should be required to maintain the soil in all its integrity and fruitfulness, and have every possible freedom with regard to the choice of crops.

With many kinds of manure in a portable form, and certified by responsible chemists, it is easy, without unduly taxing the forces in the soil, to furnish the exact stimulant needed by the plant.

Little is gained by the continual distribution of information through agricultural journals unless the farmer learns to some extent what constituents each crop requires, and ascertains the manurial value of the various remedies which are brought under his notice.

In Mr. Baird's report to the Board of Agriculture, on the County of Middlesex, as long ago as 1793, he says, "Every gardener has a favourite and particular system in the succession of his crops; but they all unanimously agree in the maxim, that to dung well, to dig well, and to seed well, is the only practice upon which reasonable expectation of a good crop can be founded." This is a grand maxim, and might well be admitted as an axiom for farmers, in the same way that it held good for the husbandmen of Middlesex, who practised spade culture, rather more than a century ago.

Under such conditions faithfully complied with, the hands of the cultivator might be left unfettered, and he might take his choice of crops, provided that he avoids certain too frequent repetitions of the same genus. He need not blindly follow any stereotyped system, but he must regulate his cropping, so as to gain by liberal manuring and good tillage as much return as the character of the holding would admit. To-day large garden-farmers have often a heavy dressing of farmyard manure, and a half-dressing from a previous year, together worth 14*l.* or 15*l.* per acre, in the land, besides the value of certain acts of cultivation; and under these conditions they farm without a lease, and with only the custom of the country and the Agricultural Holdings Act to protect them. This shows how much some men are willing to venture on a poor tenure when they understand their business. Of course, should a railway be constructed across the occupation, the tenant suffers immensely, for the landlord receives nearly all the compensation. Although the unfortunate tenant or his ancestors may have paid rent regularly for above a century, he has no claim for disturbance or severance, and receives only the value of his crops and manures, and compensation for the acts of continuing husbandry. The valuers look extremely grave and allege the precedent of the yearly tenants in Hungerford Market, London, as conclusive when land is taken by compulsory powers.

The staple crop of the country having for many years failed to bring in an adequate return, it is natural that farmers should gradually diminish their acreage under that head. Many have hoped against hope and altered slowly, for they knew not how to replace wheat, and they needed straw for the general requirements of the farm. But a gradual change has been going on little by little throughout the country. Large areas have been allotted to temporary pastures, and much land has returned to permanent pasture. The worst form of change has been where the land, left entirely to itself, has grown nothing but couch-grass and other indigenous weeds, making rough, coarse, meagre herbage quite unworthy of the name of pasture. Such grass is worthless for cattle, horses, or sheep, and can hardly be let so as to pay taxes, rates, and tithe.

Admirable pastures have been laid down recently on some farms where a real knowledge of the grasses suited to the soil was first acquired. My late genial friend, Mr. Thomas Rigby, studied and thoroughly understood this problem, and thought it of vital importance to the agricultural industry. He took me, on one occasion, to inspect the farm of Mr. John Roberts, at Saltney, near Hawarden Castle, where there were some lovely pastures laid down on land recovered from the sea, and where botanical knowledge had gone hand in hand with good judgment. Mr. Roberts is an experienced agriculturist, and a successful innovator, for he had 200 animals tied up nearly fit for the butcher, all under two years of age; he called these baby beef. To see such a large number of young animals so forward in condition, was certainly a remarkable picture, and a striking instance of courage and perseverance. The ability and skill of Mr. Roberts are undoubted, and have been acknowledged in many Show-yards, and his office at home is decorated with trophies won in numerous contests. With more grass there has been more breeding, rearing, and fattening, also a great increase in the dairy industry of the country. Milk has been the favourite production of the dairy, as the price has been better maintained than for other dairy products. It is less liable to competition from abroad than cheese and butter, and the trade has immensely increased during the last two decades. The railway companies have afforded increased facilities for the carriage of this important article of diet to populous centres; and the commerce carried on in milk between the country and the large towns is amazing.

The trade in cheese and butter, notwithstanding the increase of land under pasture, has not been so satisfactory as it should have been. The large imports from abroad have alarmed some men, and hypnotised others. Owing to the idea that we cannot compete with Denmark, Canada, the United States, and Australia, a policy of *laissez faire* comes in, to the detriment of the trade altogether. The housewife falls into the snare, when she makes her purchases, and is persuaded by the cheesemonger that Yankee filled cheese is quite as palatable, tasty, and more economical than a piece of old-fashioned Cheshire or Cheddar. And the crafty trader plays on the credulity of his customers whilst he secures a larger profit.

Strenuous endeavours are now being made on the other side of the Atlantic to stop the manufacture of filled cheese, which nefarious practice has lessened lately the United States exports. Large imports of cheese come from several countries, and a few of them which send the largest consignments are given below with a comparison of the years 1890 and 1896.

The figures are taken from the 'Australian Dairy Produce Review.'*

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* 'R. A. S. Journal,' vol. viii. p. 541.

—	1890.	1896.
	Tons.	Tons.
Canada	41,894	61,785
United States	45,920	29,059
Holland	14,611	14,649
New Zealand	1,425	2,755
France	2,018	2,284
Belgium	990	1,564

This table shows that the consumption of imported cheese has diminished from the United States and increased from Canada, most probably from the cause already alluded to.

The United Kingdom Home Supply was estimated in 1896 at 130,000 tons, whilst imported cheese from all countries reaches the enormous figure of 242,226 tons. Surely there is an opportunity for rivalry here, and the figures show that some at least of the lost ground might be retaken. It is, however, open to question whether frozen meat sold at extremely low prices has not permanently diminished the consumption of cheese.

Much of our supply of butter also comes from the Colonies and abroad, and the following table, from the same source as the last, shows the countries which are engaged most actively in this competition.

—	1890.	1896.
	Tons.	Tons.
Denmark	41,237	61,439
France	26,255	23,380
Sweden	11,212	16,191
Holland	7,803	11,723
Germany	5,223	5,391
Australia	786	8,189

The keenest rival in the trade is Denmark, so keen as even to diminish the imports of the famed Brittany brand. Sweden is a near neighbour of Denmark, and follows her methods and is in her wake. Australia is an uncertain factor, and carves out a path for herself; and her share of the trade is given only by way of contrast.

Changes in cropping entail changes of method, and if an art has been neglected or lapsed it may require to be encouraged and fostered for awhile. The best quality of cheese and butter from the most skilled dairies, like the best meat, still commands a sale, but the highest standard of manufacture is imperative. The trade in ordinary butter and cheese is faced by the intense competition from abroad, and staggers under the persistence of

.e attack. What can we do to hold our ground ? Cannot the ounty Councils, with the large funds at their disposal for lucation, funds which they hardly know how to utilise, do ıore in this matter ? They spend freely on teaching multi- ırious subjects, but there is much instruction needed so that 'e may compete on fair terms with our rivals.

Improved machinery and improved methods are good; we .eed knowledge to direct. Denmark, Canada, and the United 'tates teach dairying according to the most approved ideas, and n no half-hearted way. Only by following their example can ve hope to regain our trade and hold our own.

Butter-making is little practised in many counties, and nuch butter is made in a most unskilful manner. The people .ocally are often satisfied with their rude handiwork. Teachers should be sent into remote country districts with a view to awakening and instructing the farmers in the style of workmanship which competition demands.

Good butter will still sell in England if sent to the right market, not always to London; often a local demand will spring up if high quality is ensured.

Mr. Hoult, the President of the Wirral Agricultural Society, speaking recently, said, "Everything produced should be of the highest quality, so as to get the highest price. How much bad cheese and butter have we made in this country! And why is it? It is no greater labour to make good butter and cheese than bad, and when it is bad, it is made so in consequence of ignorance or carelessness. Now, it seems to me that the remedy is to enlighten the farmers, so that they can make use of the very latest and very best means of carrying out their vocation. The proper course to bring this about is by the County Councils paying more attention than they have hitherto done in distributing knowledge as to the best means available. Large sums of money have been voted to County Councils for the purpose of providing technical education, and I say without hesitation it is the duty of those Councils to see that a fair share of that money is spent in furthering the agricultural interest." *

This is wise counsel, and suggests certain questions pertaining to the subject. Does agriculture receive its due meed of attention at the hands of County Councils ? If the cultivation of the staple crop has been rendered unprofitable a change must follow,—what can replace cereals ? This latter is one of the problems which County Councils might help us to solve, teaching us to adopt the best subsidiary methods of utilising the soil, and dealing with its products. Ideal teaching and fancy

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* "The Position of Cheshire Cheese," 'Agricultural Gazette,' Oct. 18, 1897.

work might receive less attention till happier times prevailed in rural districts.

Thus much for dairy work and changes which have taken place on account of additional pastures, which have been laid down in many parts of the country.

Arable land predominates largely in some counties, and must also be considered.

The extended growth of cabbage and potatoes has often been objected to, though in nearly all the rotations suggested in Stephen's 'Book of the Farm,' potatoes are mentioned as an alternative crop. Yet much superstition prevails, and both these crops have been described in certain quarters as innovations, and old-fashioned members at Farmers' Clubs are never weary of reminding us that these crops are gross feeders and sadly rob the soil. As if guano, crushed bones, crushed hoofs, fish, &c., with many easily obtained manures, had never been heard of or tested.

A Northumberland farmer writes to me in answer to a query, "When I took a farm some twenty-five years ago I was limited to *four* acres of potatoes, and restrictions were quite general; when I took my present farm, fourteen years ago, a clause was in the agreement prohibiting the growth of potatoes for *sale;* but I refused to sign unless this was deleted. Very slight objection was raised, but the fact of it being in the agreement of another estate shows it to have been pretty general." This was rather remarkable among our Northern friends, for surely no crop tends more to clean cultivation than the potato.

The hoeing, scarifying, ridging, and digging, all tend to keep down weeds, and offer facilities for ridding the land of couch-grass (known in the North as *wickens,* in the South as *twitch*), and other pests. The different operations at different stages of the crop tend to bring the long stringy roots of this troublesome plant to the surface; whence they can be gathered up and burned, which is the only satisfactory way of dealing with them. In the recently published agricultural returns, Lincolnshire showed the greatest advance under potato cultivation, and in 1896 there were 57,000 acres in that county, and 1,281,319 acres in the United Kingdom. This year a light crop is generally reported as the result of the summer drought, and we are importing and shall import largely from France and Germany.

In 1895, England imported from France alone 65,242 tons, and from abroad 187,902 tons altogether, showing that nearly a third of our imports of potatoes came from our French neighbours.

Often a ready sale occurs for a bright sample of potatoes coming from one county, whilst a tuber coming from another county of a dirty, dull appearance is merely a drug in the market. This accounts for a wide range in prices, which requently exists, as in 1896, when the trade was very dull; hen good consignments were sought for and sold at 3*l.* per on, whilst bad cookers, of which there was an immense quantity, were unsaleable. Quality, as well as appearance, is of the first importance, and those of inferior size or texture should be given to horses, bullocks, or pigs. Variety of cooking might help in this difficulty, but potatoes often puzzle the kitchen-maid. C. H. Spurgeon said, "Anybody may dig up potatoes; but it is not one woman in ten that can cook them." To grow good potatoes, a change of seed is frequently needed, and fresh plants from Scotland are always worth 20*s.* per ton more to the farmers in the South than home-grown ones. If any of our readers would try ten or twenty acres of potatoes, let them acquire seed that has a record for quality as well as quantity, for the flavour of a potato is most important. Mammoth potatoes with abnormal weights are boasted of; but a potato of an enormous size is difficult to boil, and often hollow at the centre. The too liberal use of stimulating manures is deleterious, and they should be applied with great caution; for should wet weather intervene there will be a rapid growth of bine, but the tubers will be valueless. In some counties potatoes are grown in alternate breadths with cabbage, which appears an admirable device. The potatoes are dug in October; then the sheep are folded, and they glean the remaining tubers whilst wandering over the cleared ground. The better the sheep are fed, the more beneficial results will accrue to the soil, whilst the manure from the animals will be distributed over a wider area by this arrangement. At a distance from manure supply, this system enables the farmer to make his flock of sheep cover more acreage, and, by judicious feeding, materially to improve a larger breadth of land.

Large areas of peas are now grown yearly for picking, and the acreage under this crop has immensely increased. The best table varieties were formerly grown in market gardens, whilst on farms only the more ordinary sorts were known. If a farmer intended to grow peas for picking, he attended the nearest market town and purchased the cheapest sample he saw on sale. Now he receives a catalogue from a seedsman, learns the names of the most approved varieties, and must grow a fashionable pea—one that has a name for quality and flavour, and is likely to be well received in a London or provincial market. In purchasing his seed, he will give nearly as much for a bushel of hand-picked seed as would have sufficed to purchase a sack of ordinary seed direct from the barn-floor.

Many farmers grow large breadths of cabbages, savoys, turnips, and cauliflowers, and dispose of the crop to a dealer, who is often called a jobber. This middleman understands how to prepare the crop for sale in the most approved way, and knows the best market available at the moment, within a radius of many miles. He generally travels far and wide, and is acquainted with every crop that will be for sale on the countryside; he knows them as well as the sportsman who rides across the fields knows the best coverts. The farmers who sell to the jobber do not enter their lands in the annual return as market-gardens, for two reasons, firstly, because they dread to be classed as market-gardeners; secondly, because market-garden ground pays more property tax under Schedule B. At present, if a surveyor of taxes is aware that a farmer grows vegetables, and properly prepares them for market, he insists that the enterprising tenant shall have his burdens increased. He will allow no innovations if he can avoid it, but shortly and curtly insists that he has a further claim on behalf of the Inland Revenue. This is an arbitrary regulation, and in the time of the Russian war, when the property tax was one shilling and fourpence in the pound, it became a grievous infliction.

The farmer imagines that if he enters his crop as market-garden produce in his annual return, the Inland Revenue surveyor will correct or alter the return made under "The Income Tax Acts," and thus charge him nearly as much as the owner pays under Schedule A.

This makes the annual official record not quite such an accurate chronicle of changes and innovations as it would otherwise be. The Board of Agriculture is doing all that can be done with the staff at its command, and doubtless ere long some device will be discovered to check the returns in certain parishes, and materially improve the accuracy of these figures.

The official returns for Great Britain indicate to a certain extent the changes in cropping that are gradually taking place, and the following figures extracted from them furnish some idea of the number of acres during a series of five years, ending with 1896:*—

—	1896.	1895.	1894.	1893.	1892.
	Acres.	Acres.	Acres.	Acres.	Acres.
Market Gardens ..	96,696	92,837	88,210	87,560	83,081
Orchards..	221,254	218,428	214,187	211,664	208,950

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* See tables compared by Dr. Fream, 'R. A. S. Journal,' vol. vi. p. 790.

I have added 1896 to and deducted 1891 from Dr. Fream's bles in the 'Royal Agricultural Society's Journal' which ings the comparison as late as possible. These figures dicate partially the transition that is taking place year by ar, and give some conception of the gradual increase of land nder fruit and vegetables, but there must be hundreds upon undreds of farms mostly under garden culture, which are not turned as market-gardens. The new crops are entered as bbages, carrots, beans, peas, or other green crops, but there is o way of discovering the difference between cow cabbage Drumheads), white carrots (Belgians), horse-beans, and hog-eas; and those more choice and delicate varieties which equire more particular attention, and more exact treatment.

The farmer who has had to relinquish corn is naturally eluctant to acknowledge that he has taken up with garden ulture, which he essayed at first as an experiment, and hich he learned years ago to consider as a lower grade of usbandry.

Many crops which were exclusively garden crops are now xtensively cultivated on large farms and yield fairly good esults. Considerable art is required in preparing some of these egetables for sale, and their proper manipulation is not easily cquired.

Gardeners used to send peas and beans to market in baskets, ecause in this manner the vegetables travelled better and uffered less injury in transit; now most of the consignments avel in sacks. It is, however, a great mistake to put peas with natural bloom on the shells into a bag, in which they are ubbed and bruised past identification; yet this is often done by rmers.

Scarlet runners are easily cultivated, and have nearly super-eded the small dwarf French Bean; the latter at one time ould, when the trade was dull, often be sold to the pickle erchants at about 6*l.* per ton. The scarlet bean is more hardy han the French, and continues to bear fruit much longer, until he frost cuts it down. Sown in drills on tender ground the ast week in April, it blooms continually through the summer onths, and beans may be picked as late as November. The ield should be ploughed twice, and the ground well tilled for his crop. In hoeing great care should be exercised, so as not o knock down the plant, for rough usage injures it. In field ulture these scarlet beans are, in order to avoid the expense nd labour of sticks, topped closely as soon as they throw out unning tendrils.

Celery is now cultivated in the fen districts. It needs ool marshy soil in order that it may make good progress in the warm weather. Celery, of which the plants are first started in cold frames, is sent to market early, thus avoiding the risk of damage from frost, which in severe winters may be serious. One grower who understands the culture of this plant has upwards of seventy acres, and he will endeavour to reduce his acreage considerably before Christmas arrives. The cost of banking up such a number of acres in order to bleach the celery and make it white must be very great. Lettuces are planted on the field first, and spaces are left amongst them so that the rows of celery may be planted before the lettuces are cleared.

The growth of cauliflowers as a field crop has much extended of recent years, and they may be seen flourishing in many directions. This crop comes to market nearly all the year round, sometimes under the name of cauliflower, at other seasons as white brocoli; but it is most difficult to distinguish the one from the other. It is very plentiful in many counties in the months of September and October; and it is sent in the spring from Penzance and the West of England; whilst in times of scarcity it crosses over land and sea, through the St. Gothard Tunnel from Italy, and then realises about seven times the worth of the average English crop. In November 1896, consignments were arriving from France, viâ St. Malo, even whilst supplies were still reaching London from Cambridgeshire and other near counties.

Orchards have been mentioned in the table given previously, but they cannot be considered here at any length. The stocking of an orchard is an important undertaking, the cost of choice trees and the selection of the kinds being serious matters. This, therefore, cannot be included among practical changes for a tenant.

Fruit-growing needs a special training, and is quite a science in itself. There is always a sale for high-class apples and pears, as our bountiful importations from abroad plainly indicate.

The large preponderance of orchards over vegetable areas is astounding, and it would be difficult to account for the figures, except for the explanation already given in this article.

But there is a gradual increase of small fruit, and it has been grown with a fair meed of success. Tenants with security of tenure, who have had suitable instruction and practice, combined with experience in gathering and packing the fruit, will probably succeed.

Currants, strawberries, gooseberries, and raspberries may be seen in large fields in several counties, and are easily managed by men who have acquired the craft, whilst there are hundreds of miles covered with glass, where flowers, grapes, cucumbers, and tomatoes, &c., flourish, as well as they do in warmer and sunnier climes.

In conclusion, I would suggest that any *innovations* should be tried on a limited scale in the first instance, and not without considerable forethought and preparation.

VII.—*The Management of Pigs.* By JOHN FREDERICK HALL.

THE successful management of pigs is a question of essential importance to dairy farmers, because the bye-product of their industry, whether it be whey or skim milk, may be profitably employed in the production of pig-meat. Many cottagers keep a sow or a few pigs to fatten, and some are excellent managers; but it does not follow that the rearing of pigs is a simple matter. On the contrary, those who undertake it without experience or preliminary study are apt to find themselves committed to an unprofitable enterprise. There are several stages in a pig's growth, at each one of which carelessness or ignorance will be certainly followed by bad results.

Not only do such evils as small and weakly litters, stunted aftergrowth, and inaptitude to acquire flesh, but also chills, coughs, diarrhœa, cholera, and similar ailments tell adversely upon the balance sheet, and, in most instances, point to some defect of care, of knowledge, or of proper accommodation.

The practice of farmers in regard to pigs varies considerably. Some breed pigs and sell them as weaners; others as store pigs; others, again, as porkers. Some breed no pigs at all, but buy what they want from their neighbours; others not only breed their own pigs but retain them on the farm till they are ready for the bacon factory. This article deals in the main only with the last case, that of the farmer who breeds and fattens his own pigs.

THE STOCK.

The selection of breeding stock will depend upon the object which the farmer has in view. If this be bacon, opinions will differ as to the best sort of pigs to keep. At various times I have kept pure Berkshire, and Tamworth, as well as crosses from both breeds; crosses in which the blood of the large Yorkshire predominated, and an ordinary local breed of no racial pretensions, but probably derived from what Billingsly, writing in 1798, calls the native white breed of Somerset with large ears and long body. Berkshires with their crosses made excellent porkers, but were less satisfactory as bacon pigs. Tamworths and their crosses made good lean bacon, but were too slow in reaching standard weight. The cross of large Yorkshire tended to coarseness. On the whole, the local sow, carefully selected for shape and mated with a large-sized, small-boned boar of the same nondescript sort, gave the conditions sought for, namely, a vigorous young stock, hardy, of fairly quick growth, and such as—when fat—secured the approval of the curers.

Some sows produce larger litters and are better mothers than others; these are the animals to select as the dams of breeding sows.

PREGNANT SOWS.

Sows do best when kept together in a warm sheltered paddock. An acre of ground will suffice for twelve or more. There should be some trees for shade. For several months of the year, according to the season, the sows remain out night and day and do well; but some refuge must be provided for them from cold rains, heavy showers, and rough bleak winds. Chills are produced by lying on damp ground in exposed situations, and their effects are certain to be revealed when the next litter is born. No elaborate structure is needed—merely a shed with a sloping floor laid on concrete, a sound roof, and an open doorway facing south. To this shelter the instinct of the pigs will lead them directly the state of the weather demands it. The lack of such a shelter may occasion a loss of from fifteen to twenty per cent. of the young pigs. Cleanliness in the shed may be promoted by feeding at a distance of 150 yards from it.

Sows do not cost much during the earlier weeks of pregnancy: grass affords a good deal of nourishment most months in the year, and may be supplemented by sufficient roots, cabbages, grains, or bran, to keep the animals in condition. In cold weather, when steaming or boiling food for the other pigs, swedes or potatoes, boiled and mashed with bran, pollard, or sharps, are beneficial. Separated milk or whey makes an excellent addition to the diet. Sows advanced in pregnancy should receive a little more and better food, but must not be made fat.

PARTURITION.

A few days before the sow is due to farrow, she should be separated from the others and placed in the farrowing stye. If the floor is of brick, stone, or concrete, a large wooden stage is provided for her to lie on. A rail is fixed at a height of 12 inches from the floor, and at the same distance from the wall, so that young pigs may be protected from the risk of being crushed between the sow and the wall. When a sow is arrowing her attendant should always be at hand. If this nvolves sitting up at night the man should receive a small gratuity for his services. As the pigs are born they may be placed in a flannel lined basket.

Sows must be kept quiet and isolated at this period; if they are near other pigs they will start up at the least noise, and are very likely to destroy some of their young with their movements. A sow with young pigs must not be bedded in long straw. When the pigs are ten days old they and the sow may be moved into an ordinary stye, and allowed to run out in the enclosed yard for an hour or so in fine weather; but the stye must protect them from draughts and should face south. The construction I prefer for both sows and pigs at this stage is a series of roomy compartments or styes under one roof, but separated from each other by walls 4 ft. high. The floor is of black brick, set in cement, or of Portland cement, with no porous joints that can harbour disease. Connected with these styes by doors which can be made fast at will, are a corresponding number of small yards in which the food is given during the warm season. The drainage is open until it passes outside the house into glazed pipes which conduct it to the liquid tank.

Water taps in the house permit of the styes being washed out daily; a process which is only omitted in cold weather. The pigs lie on a wooden stage, and sometimes have straw in addition. Styes are not naturally so offensive as fattening pens, and the requisite ventilation may generally be obtained by raising a few of the ridge tiles in the roof; if, however, this is insufficient, a few common drain pipes traversing the bottom of the wall will admit the necessary quantity of pure air. The shed must be well lighted.

Sows with young pigs should be fed three times a day, and the quantity proportioned to the size of the animal and to the number of young she has to support. For the first twelve hours food should be given very sparingly. Warm skim milk with a little bran is suitable food; but after the first day food may be gradually increased to a liberal diet. Boiled or steamed roots, such as swedes and potatoes and cabbage, mixed with sharps, or bran and sharps, is good milk-forming food. If the sow is rearing a large litter it will be advisable, as the pigs grow, to add a little wheat or barley-meal to the food. When young pigs begin to feed out of the trough they should be tempted to eat with a handful of beans or peas, but should be fed in a separate trough, placed away from the sow, or she may resent their intrusion.

CASTRATION AND RINGING.

Castration takes place when the young pigs are from three to five weeks old; the better results appear to attend the earlier operations.

Soon after weaning—at about six to eight weeks old—the pigs should be ringed; the sow should always be kept well ringed, otherwise her search for roots, &c., will produce a most unsightly effect on the pastures.

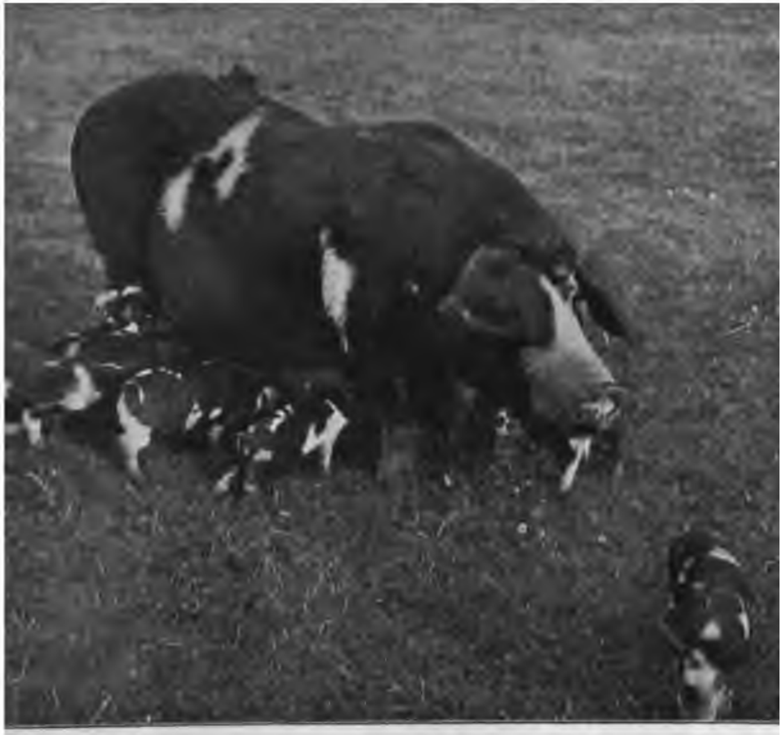
LITTERS.

The average number of pigs born and weaned upon a farm is a very fair test of the efficiency of the management and of the suitability of the accommodation. Not even hardy, cross-bred sows will give good results under bad conditions. Personal experience has convinced me that an unpleasant surprise awaits the individual who thinks that rough-and-tumble buildings and rough-and-ready methods are good enough for pigs! Waste produces want, and where dirt, discomfort, and disease exist, there are the elements of a threefold waste—waste of food, waste of energy, waste of life! Very large litters are not desirable, as even when the sow has milk for all they are apt to overtax her, and as they generally include some weakly under-sized pigs that spoil the appearance of the lot, and are a perpetual nuisance in the after-stages of growth. At the same time, a sow which produces two litters each of twelve pigs within the year and turns them out creditably at weaning time, is not an animal to be despised. The illustration (No. 1) is of "Diana," a cross-bred sow, who bore her first litter of ten pigs at the age of eight months and three weeks, and who gave birth within the twelve months ending December, 1897, to forty-eight live pigs, of which she was permitted to rear thirty-six. These litters were as follows:—

February 12th	15 pigs, reared	12
July 28th	16 „	12
December 24th	17 „	12
	48 pigs, reared	36

All those reared were sound and healthy animals. Two other instances of fecundity may be quoted. Two young cross-bred sows produced and reared in twelve months two litters each, forty-one pigs in all. Again, in the year 1895–96, three cross-bred sows yielded seventy-one weaned pigs within twelve months.

But these examples are beyond the average, and where both



No. 1.—"DIANA."

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and hilts are kept on a large scale for breeding purposes the cer does well who succeeds in obtaining two litters per per year, and an average of sixteen weaned pigs per sow. kly pigs are best killed at once.

THE BOAR.

he boar should not be kept in close confinement, but should e the run of the paddock with the sows. He thus shares ir food and shelter, and is less liable to become savage. Old rs beget small pigs.

WEANED PIGS.

A varying interval takes place between the weaning of the s and the time when they are selected and put up in groups fattening. Pigs that leave the sow in good growing order rt life under the most favourable conditions; but they must kept growing, and not allowed to lose ground after quitting ir mother. If the weather is cold they will want a warm shed, the run of a sheltered straw yard, covered in, if possible; but it be fine, and not too cold, the best plan is to give them the ge of a large meadow by themselves. They will pick up a nsiderable portion of their own food, and the exercise seems t only to keep them in health, but also to give them an petite for their regular meals.

Healthy little pigs are fascinating little animals; but at times ir ways are so peculiar as to entitle them, one would say, to ourth place in King Solomon's category of things that were wonderful for him. Watch them for a moment on a bright ing morning, when they are turned out in the home orchard. r a time they are quiet and sober-minded, straying about h snouts on the ground amid the dappled shadows, and ering frequent baby-grunts of satisfaction. Suddenly, one of ir number—a born leader—flings his head in the air, stands an instant as if transfixed, and then, forming a rapid resoion, darts for the white gate. Quick as thought the whole pack uched by some impulse occult or mechanic," is after him. looks impossible for them to squeeze under the lower bar, ich is close against the ground; but, presto! the thing is ne, and an alert little group stands on the far side, somewhat tered perhaps, and with a droll air of having momentarily gotten what brought them there! The odds are that, within minutes, they will all have returned to the orchard by the ne route and with the same precipitancy with which they tted it. These break-neck excursions will be repeated at intervals throughout the working day, but their motive never transpires.

Between May-day and the middle of October is the best time for turning out young pigs. In autumn they will improve upon the acorns and beech-mast they pick up; but in late autumn, winter, and early spring, they do best under shelter. Time, which cannot afterwards be recovered, is frequently lost with young pigs; under all circumstances, therefore, they must be watched, and be promptly assisted if they seem to be losing ground.

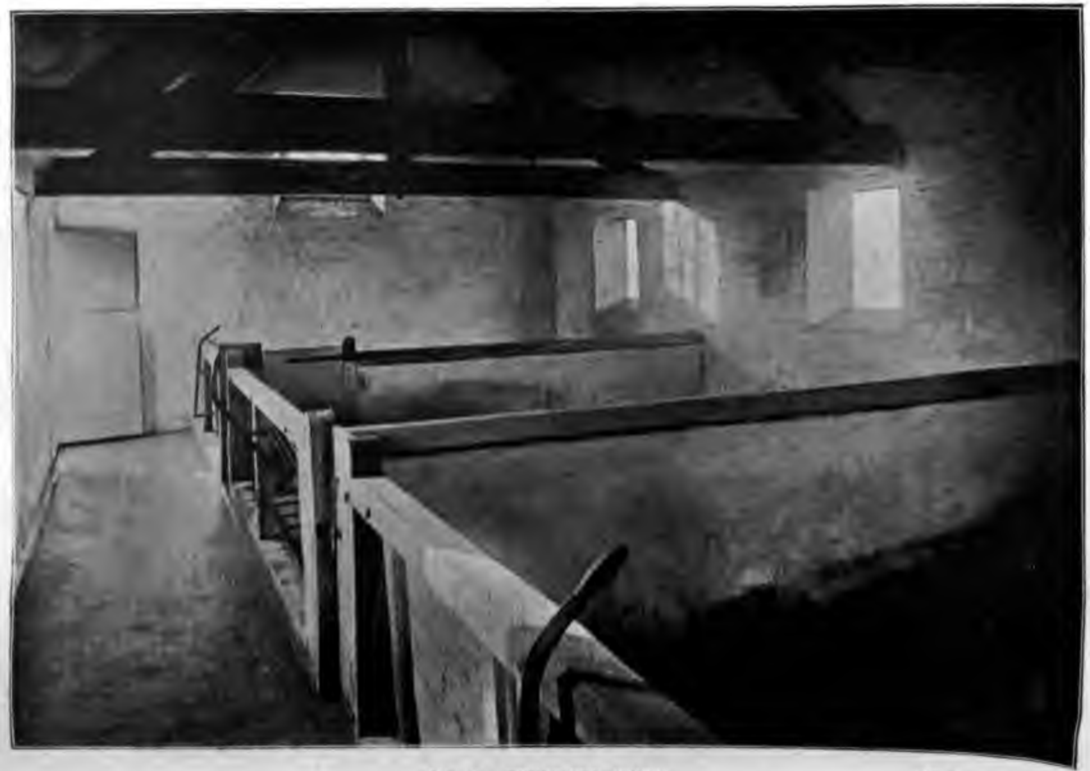
The food at this stage should be flesh-forming and bone-forming, rather than fattening, and should be given twice a day. Pollards, mixed with roots, such as swedes and potatoes, and moistened with skim-milk, make a good diet. In winter the pigs require more of it, and the roots should be boiled or steamed, and given warm three times a day. I like to place them in the fattening pens, weighing on an average 80 lbs., or rather more. If this can be accomplished within ten weeks from the time they are weaned it is good work. The pigs will then be seventeen to eighteen weeks old, and, in the majority of cases, the required weight will not be gained till, perhaps, a fortnight later.

To succeed in bringing store pigs to the standard of 80 lbs. within eighteen weeks of their birth—without selecting the most promising youngsters, or confining them in a shed and supplying unlimited meal—is, in my opinion, conclusive evidence that the pigs are naturally of vigorous constitution and have been judiciously treated. Of course, artificial conditions of shelter, warmth, food, &c., lead to earlier development; but I am not sure whether this advantage is not gained at disproportionate cost; nor am I sure that it is not attended by increased loss of live weight when the pigs arrive at the last stage of their career. The latter point will be noticed hereafter.

FATTENING PENS.

Let us assume that at from eighteen to twenty weeks old the pigs are found to be of the required weight. They are then separated into lots of ten to fifteen, and distributed among the fattening pens. Less than ten in a lot is undesirable, because a railway-truck holds this number; while more than fifteen is too many to feed in peace from a common trough.

From the day they are penned, weighing 80 lbs. average live weight, to the day they are dispatched to the bacon factory should not exceed throughout the year an average period of thirteen weeks. In this interval they must put on enough flesh to raise them to an average of about 220 lbs. live weight



No. 2.—THREE-PEN HOUSE

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ıring these thirteen weeks they are kept entirely in the pen, d, as the conditions are purely artificial, must be carefully arded against the effects of excessive heat and cold. Such :angements must be made as will ensure cleanliness, dryness, ırmth, ventilation, and economy in food and labour.

The fattening pens at Chilcote are 14 ft. long by 12 ft. wide, and ranged side by side under one roof, separated by walls 4 ft. gh. The feeding gangway runs at the back of the pen down e whole length of the shed, and communicates at the further d with the meal and boiling room. The partition walls are ilt of stone 16 in. broad, and are faced with Portland cement; e feeding troughs are made of the same material, and are ossed transversely by iron rods built into the troughs, which lot to each pig his own portion of the feeding-space; the utter or flap, suspended between the trough and the feeding ngway, is of wood covered on the inner (or pig's) side th sheet zinc secured by copper nails; the woodwork of e stages on which the pigs lie is crossed transversely with op iron at intervals of 3 in., and securely nailed down; e woodwork of the door, and any other exposed woodwork, is :ewise protected by sheet zinc. Drainage is open, passing rough the centre of the building, and connecting outside th the liquid manure tank by glazed pipes. Water is supplied m taps in the gangway. The floors of pens and gangways are id in White's Portland cement upon a concrete foundation, ording a solid and impervious surface. Windows, except one each gable, are not made to open, but are simply sheet glass, ar or opaque, set in cement. Tiles on the roof ridge are ised at intervals, and there is a louvre which can be opened or sed at will to secure ventilation. The walls are white-ıshed.

The accompanying illustration (No. 2), which, being taken in idwinter, is not wholly satisfactory, gives a general idea of a pen house, constructed on the above plan, fattening forty-five gs simultaneously.

The structure described has been adopted, not only with a ew to durability, but also to keep down vermin, such as rats id mice. Pigs, especially fatting pigs, who have much time on their hands," are most destructive animals. If walls are uilt of ordinary brick, or of stone, and mortar, they will work ıe mortar out of the joints and undermine the structure; if oodwork is exposed they will gnaw it into unsightly wreckage herever they can reach it. Windows and window-sashes ecay rapidly in the warm moisture of the fatting pen, and ust be kept constantly painted to preserve them, but ventila-on can be secured without sashes, and sheet glass set in cement admits all the light needed, and is a permanent form of con tion. Ordinary floors of brick or stone set in mortar are objectionable, as becoming in the course of time harbou disease. The joints admit liquid, and the ground underneat stones becomes saturated with filth, and the home of di spreading germs.

Again, the house described is practically rat-proof; th of concrete and cement baffle the rat, and there is no en except by the door, and no shelter if he does effect an ent The condition of the sacks in the meal house is suf evidence that neither rats nor mice find the accommodat their liking.

The floors are washed daily, except in cold weather, a a simple adjustment the water passes into the ordinary without unduly diluting the contents of the liquid tank.

THE LIQUID MANURE TANK

holds about 40 to 50 hogsheads. It has no overflow but a tell-tale arrangement conspicuously placed shows w requires emptying. The contents are conveyed to the gras by a travelling tank.

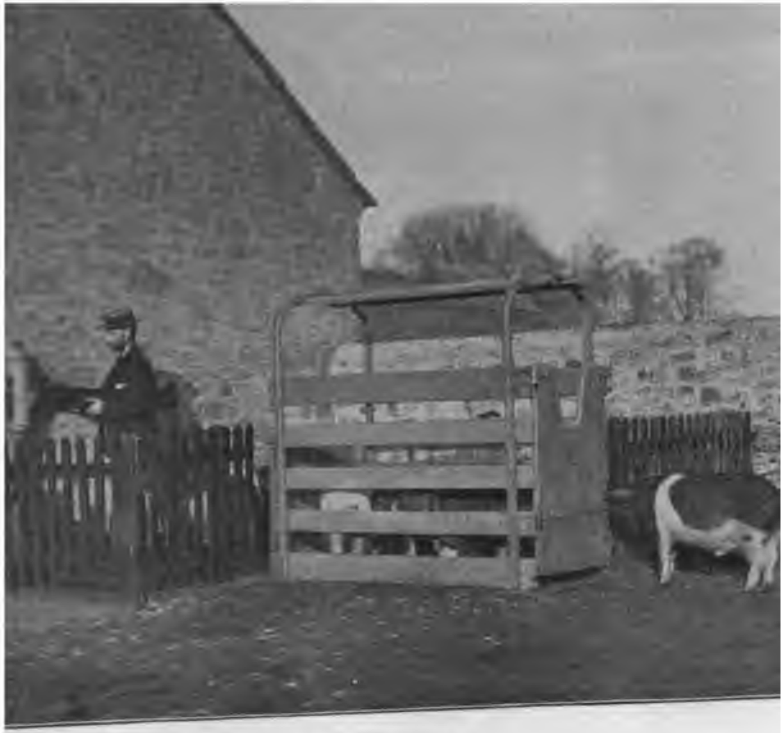
THE WEIGH-BRIDGE.

As it is very useful to know the rate of progress of the v pens, a weigh-bridge is fixed outside the shed, and immed adjoining it. This machine, which was supplied by M McJannett & Co., of Stirling, N.B., has been of great serv the farm. It is a simple practical machine, supplied reasonable cost, easily fixed, and will weigh three fat a time. The possession of a weigh-bridge informs the when the pigs are ready to pen, how they progress, whe are ready to kill, enables him to compare the mer different systems of feeding, and, lastly, gives him an ab check upon the loss of weight in killing and dressing. pen of pigs is weighed at the same time on the sam once a week, and the average weight of the lot is rec The process takes very little time, as the machine is erect small enclosed yard close by the pen, which affords the chance of escape.

The illustration (No. 3) shows the arrangement of the bridge, and the weighing of a small lot.

THE MEAL HOUSE

is situated at the end of the fatting shed, and opens d into the feeding gangway.



No. 3.—WEIGH-BRIDGE.

It is about 16 ft. square, with a cement floor and a large copper in the corner. Roots are boiled here daily during the winter months to mix with the meal. Rats and mice are entirely excluded, so there is little or no waste of food.

Physiology of the Pig's Digestive Organs.

The food given to the pig in the fatting stage must be adapted to the peculiar nature of his organs of digestion, which are unlike those of other animals of the farm. The stomach is small, while the intestines are of great length. Professor Henry Stuart gives the following table, comparing the digestive organs of cattle, sheep, and pigs:—

—	Stomach.	Intestines.
	per cent.	per cent.
Ox	11½	2¾
Sheep	7½	3½
Pig	1¾	6¾

"These differences," continues the Professor, "have an important relation to the feeding and nutrition of the animal. The pig, having so small a stomach, necessarily lives upon concentrated food taken in frequent meals, while having so extensive an intestinal canal its digestive functions are very active, and a larger quantity of food can be disposed of. . . . When feeding at large, it is continually seeking food, which passing through its small stomach is rapidly digested, almost as it is eaten; while, when kept in confinement, it gorges itself to fulness, and then sleeps while the food is being digested; and, as the digestion is rapid, the appetite is quickly excited again, and the empty stomach calls for more food. Then, with frequent feeding and active digestion, and rest meanwhile, the pig is able to take on more flesh and make more fat than any other animal during the usual fatting process, and when in growth it makes more proportionate weight. But this peculiarity tends greatly to disease, and thus the pig is most generally injured by overfeeding, and its intestines are most subject to inflammatory disorders. It consequently suffers more than any other animal from intestinal and pulmonary fevers, of which the two forms of the so-called cholera are the prevailing types. Its appetite is also unduly excited by the greater demands of the digestive apparatus upon the supplying organ—the stomach—and hence its excessive greediness is to be restricted by ju feeding."

FEEDING.

Consideration of the above passages teaches us that concentrated food, such as barley and maize meals, are ob adapted to the pig's organism, yet there is great risk att a diet composed of these alone given in unlimited qua Roots, such as potatoes and swedes, are not so well ada hurry on the development of the pig; yet a certain adn of these with the meal is an undoubted precaution agai risks of over-feeding. Another lesson is, that fatting pigs be fed at least three times a day, and that the third meal be the heaviest, and given as late in the evening as arranged.

In winter, each meal is warmed; at other times, th boiled in the morning are mixed with meal and skin when cold. The roots which suit the pigs best are swe potatoes; they are pulped before boiling. Bruce and M Bonum potatoes are the sorts we generally grow. the first five or six weeks, maize and barley-meal ar in about equal proportions; afterwards, the pigs are f on barley-meal and potatoes only. Cabbage is of no fattening pigs.

RATE OF GROWTH.

The rate of progress during the fattening stage varies co ably. Changes of temperature affect the growth of t sensibly; but, apart from all assignable causes, some pigs fatten much faster than others. Pigs penned betwee and October generally do better than those fattened b November and March. The following figures give the actual progress per week of five lots of pigs, numbering s six, fattened between Oct. 1896 and Oct. 1897:—

When penned, average weight per pig ..	78 lbs.	
1st week after penning	85 „	increase 7
2nd „ „	95 „	„ 10
3rd „ „	106 „	„ 11
th „ „	115 „	„ 9
5th „ „	126 „	„ 11
6th „ „	137 „	„ 11
7th „ „	148 „	„ 11
8th „ „	160 „	„ 12
9th „ „	173 „	„ 13
10th „ „	187 „	„ 14
11th „ „	200 „	„ 13
12th „ „	214 „	„ 14

ning from the starting-point of 78 lbs., the average in- of live weight is

uring the first four weeks after penning, at the rate of 9¼ lbs per pig.
„ second „ „ „ 11¼ „ „
„ third „ „ „ 13½ „ „

eader may possibly be surprised that the increase is not rapid, and that in comparing the average rate of growth in irst four weeks with that of the last four, the ratio of ase is only as 9¼ to 13½ (37 : 54). But he must bear in that the system of feeding described is not a forcing one, hat during the first four to six weeks it has included a con-able quantity of home-grown produce, and only compara-y a small quantity of bought meals. This method of feeding adopted originally on economic grounds. Probably more results would be obtained by dropping the roots and ng with more barley-meal from the first stage. But here uestion arises—would more rapid development produce a t that would compensate for increased consumption of bought ?

nother argument against pushing pigs too rapidly is that in warm weather pigs which are fattened on meal alone are ct to attacks of something like apoplexy: the pig may to ppearance be hearty at 10 A.M. and be dead by noon. The er of this disease is certainly reduced by the adoption of a heating diet.

any one unacquainted with the use of the weigh-bridge ould certainly be a surprise to note the variations in the ress of the pigs from week to week. The treatment may he same, the conditions may be apparently equal, but comparing week with week it will be found that, instead well-defined steady ascent, progress is made by alternating ks and rebounds. Pigs which put on 7 lbs. this week will enly rise to 12 lbs., and then sink back again to 8 lbs. or ., without apparent cause. Of course in dealing with aver- these discrepancies tend to disappear in proportion as the is extended from which the statistics are drawn.

fore quitting this branch of the subject it may be useful to out another advantage attending the collection and study eigh-bridge data. When the pigs, weighing an average live ht of 80 lbs. to 100 lbs. or more, are placed in the pen, armer knows exactly how many weeks it will occupy on egular rules of diet to raise them up to the required level of, 220 lbs. live weight, or more. As already pointed out, gh the rate of growth in any particular week cannot be cted, yet when observations are extended over a series of weeks, the results confirm each other in the most striking way. It is the practice at Chilcote to have a slate in the gangway suspended from the wall opposite each pen. On this is recorded the date of penning and the live weight, also the date at which they are expected to be ready for slaughter, thus—

Lot A. 15 pigs.
Penned 1st May.
Live-weight, 80 lbs.
Date of slaughter, estimated 5th August.
Last week's live-weight, — lbs.

An experienced man glancing at these items can see at once if the pigs are progressing satisfactorily. We seldom find the estimated date is exceeded; it is more frequently the other way.

PERIOD REQUIRED TO GROW AND FATTEN A PIG.

The records of the past three or four years tend to show that the fattening of pigs up to 8 or 9 score dead weight within twenty-six weeks of their birth, though accomplished at Chilcote on some occasions, is a flattering representation of the average rate of growth; that average would be much nearer the following:—

With the sow	7 to 8 weeks.
Early growing stage	10 „ 12 „
Fattening stage	11 „ 12 „
	28 to 32 weeks.

These figures do not represent picked individuals, born in April or May, and grown and fattened in the most favourable portions of the year, but fair average pigs farrowed at different times throughout the year.

COST OF FEEDING.

Farmers have a saying that in gaining 100 lbs. live weight a pig consumes 400 lbs. meal and corn. We assume that this estimate applies to that stage of the pig's growth when he advances from, say, 120 lbs. to 220 lbs. live weight. It probably is not intended to hold good in respect of the prior stage when the pig is under 120 lbs.

Sir John Lawes (Bath and West and Southern Counties Society's 'Journal,' vol. xiii. p. 233) rates the consumption of food at a higher figure. He states, as the result of his experiments, that 500 lbs. weight of barley-meal will be required to produce the same increase. My experience at

Chilcote is that, by the time an average pig reaches the desired weight of 220 lbs. live weight, he has consumed *in his life* about 520 lbs., or 2½ sacks of mixed barley and maize-meal. The average cost per sack is about 9*s.* or 10*s.* As a considerable proportion of this meal is eaten before the pig is penned for fattening, the comparison with the two former calculations is unquestionably favourable to our method of feeding. The economy in the use of meal must be ascribed not only to the substitution of boiled roots for meal, but also to the careful avoidance of all waste.

MANURE.

Some portion of the cost of the food will be recovered from the pig in the value of the solid and liquid manure. Sir John Lawes estimates that 500 lbs. of barley-meal consumed by pigs produces 70 lbs. of solid manure. One hundred fat pigs, therefore, ought to leave on the farm about 62½ cwt. of highly nitrogenous solid manure.

LOADING PIGS FOR MARKET OR RAIL.

A detail that is frequently neglected in the designing of pig buildings is a suitable provision for transferring fat pigs to the waggon or cart, without rough handling and waste of time. The ordinary mode of loading a waggon with pigs, weighing about 2 cwt. each, involves not only much unnecessary exertion, but is also attended with considerable risk to the pigs. A proper arrangement is easily made where there is sufficient difference between the external level of the ground and the internal level of the floor. The accompanying illustration (No. 4) shows the plan adopted at Chilcote for loading pigs. At one end of the shed, where the level falls about 3 ft. 6 in. below the floor-level, a door opens outward from a passage connected with the fatting-pens. When pigs are loaded this doorway is thrown open, the waggon is backed up against it, and the tail-board falls down upon a projecting stone sill. Straw is laid down in the passage and in the bottom of the waggon. The pigs are then let out, and gently driven along the passage and through the doorway into the waggon. It takes less time to load fifteen or twenty pigs in this manner than to write this description of the process.

DIFFERENCE BETWEEN LIVE AND DEAD WEIGHT.

The loss in killing on the live weight of pigs is a subject on which it is not very easy to obtain accurate or consistent information, and it must remain surrounded with more or less uncertainty until the weigh-bridge is brought into common use. There is no doubt that, under perfect equality of treatment at the hands of the butcher, some lots of pigs show much worse results than others. In a letter before me, the writer, a bacon-curer in a large way of business, remarks: "There is a great difference in the way in which pigs—particularly summer-fed pigs—turn out. I have known live pigs lose one-third in killing, owing to an unusual proportion of offal. Only last night our butcher drew my attention to the excessive loss of live-weight in some pigs he had killed, caused by the exceptional size of the 'liners' (lining membrane). All these pigs were under 8½ score. I think it probable that pigs lose weight at death, not only when they have been fattened too rapidly, but also when they have been poorly fed, or through some constitutional cause have been bad doers from the first. In all these cases there is apt to be produced a disproportionate amount of offal. . . ."

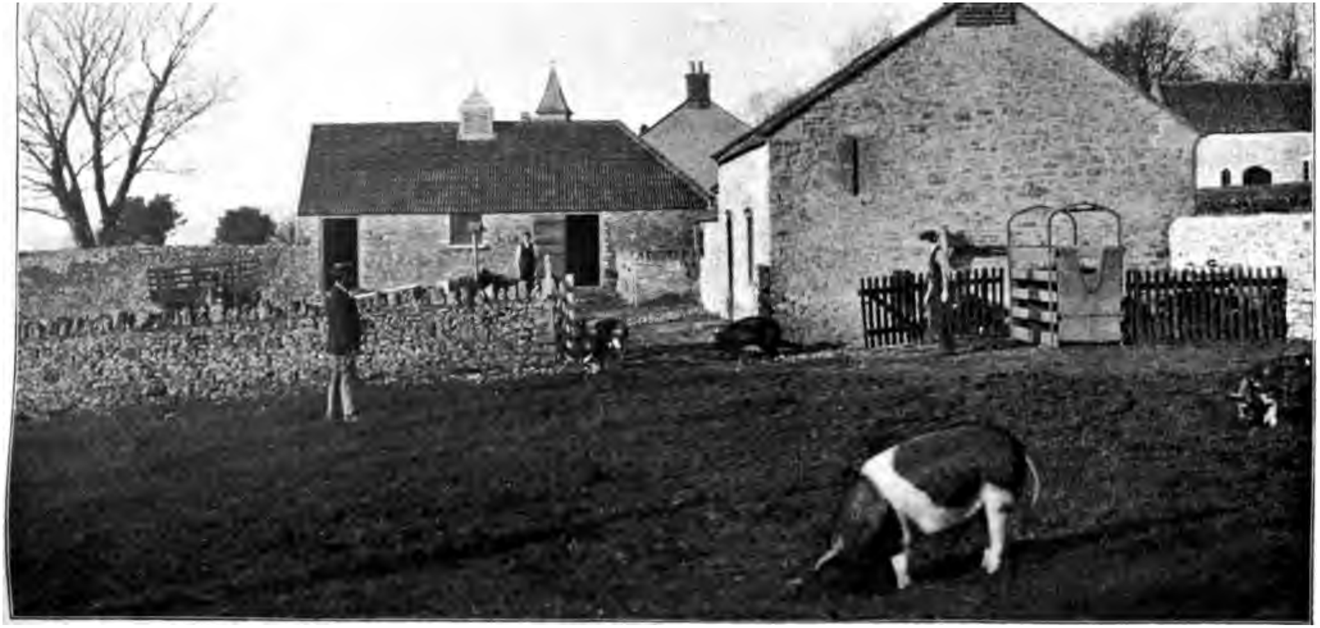
These remarks are worth attention, for common sense, no less than observation, teaches us that when the digestive organs are overtaxed either by natural weakness, or by large bulks of unsuitable food, or by over-feeding, there is likely to be an unhealthy or abnormal condition of these organs.

The average loss in killing pigs fattened at Chilcote, under the system detailed, is a trifle under 30 per cent. Thus, 146 pigs killed during the last eighteen months weighed alive, on an average, 213 lbs., and dead, 152 lbs. But by attention to diet and management, this average tends to decrease, and we expect will not exceed 28 per cent. during future years.

The loss on individual pigs varies greatly, and is sometimes quite unaccountable. The average loss is a little over 60 lbs. per pig; but we have known it as much as 80 lbs. on eleven score live weight, and in a few instances even 85 lbs.

Again, although the average loss on the lot amounts to 30 per cent., yet this also varies considerably. In some cases it has been as low as 26 per cent., and in one case it reached 35 per cent. In such an extreme instance as the latter, it is difficult to resist the conclusion that the method of dressing the pigs bore hardly upon the seller. Some curers habitually include certain parts of the animal, such as the liver, in the offal; others, more liberal, give the farmer the credit for the weight.

If for no other reason than to possess an absolute check upon loss of weight in killing, the use of the weigh-bridge by all persons engaged in pig-fattening is very desirable.



No. 5.—GENERAL VIEW OF PIGS' [illegible]

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CONCLUSIONS.

The points to which, in connection with pig breeding, rearing, and fattening, endeavour has been made to give special prominence in this article, may now be summarised.

I. Suitable buildings are of essential importance at every stage of the pig's life. These need not be costly, nor in a majority of cases need they be new. Old farm buildings, frequently unused ones, may be converted by a little contrivance and labour into useful and sufficient accommodation. Warmth, ventilation, a sound roof and a sound floor are primary requisites so far as buildings are concerned.

II. Greater economy in the use of bought foods, like maize, and in most instances barley-meal, is very desirable. The greatest advance in this direction must be sought in the substitution of boiled roots, such as potatoes and swedes for meal; but something may be done by adopting such a system of construction as shall banish rats and mice from the premises.

III. Increased attention to cleanliness will not only tend to promote health, and thus to reduce the risk of losses by disease, but also to induce a more rapid growth and development.

IV. A weigh-bridge is not indispensable, but is a most valuable adjunct to the farm premises; for it teaches many lessons and places knowledge on an incontrovertible basis of fact. The progress of pigs of different breeds, or fed upon different systems, can scarcely be satisfactorily compared without the employment of the weigh-bridge. Again, in checking the loss of live weight in killing, the possession of a weigh-bridge confers a sensible advantage upon the farmer.

In conclusion, I cannot but express the hope that some of the school-farms in the country will take up and thoroughly investigate the questions of breeding, rearing, and fattening pigs. A series of well thought-out experiments and researches directed to ascertain the merits of various breeds and cross-breeds, systems of feeding at different stages of the pig's growth, progressive live weights, &c., would, I am convinced, elicit much more information than we have at present, and would prove a real boon to the dairy farmer of Great Britain and of Ireland.

VIII.—*Cider-Making in Devonshire.* By H. J. W. COULSON.

THE awarding of the Champion Gold Medal at the Southampton Meeting of the Bath and West and Southern Counties Society to the cider made on the Home Farm of Sir J. H. H. Amory, Bart., at Lythecourt, Tiverton, N. Devon, led to an opinion being expressed by the Society's Stewards that a short account of the process by which this success was obtained would be useful to those who are interested in the production of pure and unadulterated cider. I propose, therefore, to give as concisely as possible a sketch of our system of manufacture, touching principally on those points which, from my own experience as manager of the business, seem most important.

ORCHARD CULTURE.

In cider-making, as in most other industries, it is necessary to begin at the beginning, and no man can expect to make good cider unless he attends to his apple-trees. I may say that we do not owe our success to any special selection of vintage fruits, the condition of our orchards precluding this; we have had to take the apples more or less promiscuously, as the time and labour required for sorting would make any such attempt far too costly. Blending the cider in a large vat, so that the bulk of the liquor may contain a mixture of all the various bitter-sweet, sweet and sour apples, seems to be the easiest plan.

Some three or four years ago, having been struck by the dilapidated and neglected state of the orchards in the district, we arranged with Messrs. Richard Smith and Co., of Worcester (who are large fruit-tree growers in the West of England), to send down a first-rate pruner, who gave us excellent instruction. Since then we have regularly pruned the whole of the thirty acres of orchard on the farm, and with the most beneficial results. The first pruning of neglected trees is a somewhat serious matter, but after it has once been done a man can run over an acre in a few hours. We prune severely—not merely cutting out the dead wood, but thinning the heads of the trees regularly, so that no branches can cross or touch. The advantages of this plan are manifold: (1) We get much finer fruit both in size and quality. (2) Canker is much reduced. (3) The lichen and moss almost disappear. (4) The trees are much less likely to blow down, as was exemplified most strikingly in the great gale in March last year. (5) The herbage of the orchards is much improved by the admission of more light and air. The best time for this work is from November to March.

After the trees have been pruned, the trunks and branches are well brushed with a stiff besom and dressed with a composition of water, quicklime, cow-dung, and paraffin, in order to kill and dislodge the various insect pests and grubs which infest them. We also find grease bands highly efficacious in catching the winter and other moths which ascend the trunks for the purpose of laying their eggs in the buds and crevices. The lichens and moss which festoon the trees in this district are much reduced by free use of the pruning knife, and can be finished off by the simple process of throwing fresh powdered lime up among the branches on a damp still day in winter. I am fully satisfied that the time and trouble involved in the proper culture of orchards is not thrown away, and that care and attention are fully repaid by healthier trees and improved fruit.

GATHERING AND STORING THE FRUIT.

The next points to be attended to are the gathering, storing, and ripening of the fruit. We pick the orchards over three times—the last time shaking down the apples still on the trees. The first gathering and the windfalls are kept separate, and made into second quality cider for farm consumption. Where possible we store under cover, using a granary—an old pound-house chamber—and a cart linhay for the purpose. When storing in the orchards we always make hurdle-stores, such as are recommended in this Society's 'Journal' for 1893–94, page 87. This is an excellent plan, as the fruit is kept off the ground, and will keep for a month or six weeks, without heating or rotting. We line the hurdles with rabbit-wire, to keep the apples from falling through. As far as possible, the apples are ground before they get at all rotten, and all black, rotten fruit is carefully picked out. No cider should be made before the middle of October, as experience shows that it keeps better when made after that date.

MANUFACTURE.

Our factory at Lythecourt is a large disused barn, light and well ventilated. This and the cellar beneath are whitewashed every year, and the presses, mill, &c., are at the beginning and end of the season thoroughly scrubbed and washed with sulphite of lime powder. The motive power is a six-horse power steam-engine, which drives the elevator, mill, press, and two rotary pumps. The apples are thrown from the carts into a shute, which conducts them to the elevator. This elevator takes them to the mill. Beneath the mill is another shute with a trap-door at the bottom. This shute holds enough pomace to fill the cage-press beneath. The pomace is pressed once in the cage-press and then transferred to a large hand-power press, where it is pressed a second time—the juice from the second pressing being generally inferior is kept separate. The juice is pumped from the presses into four large vats, holding about 200 gallons each, and thence, if necessary, into a large blending-vat, which holds 1,000 gallons. The vats have loose covers, and are not filled above 9 inches from the top. The head is skimmed off the vats once, twice, or even three or four times, as the case may be. The next and most important step is filtration. Lumley's "Invicta Fibre Pulp Filter," described in the Society's 'Journal' for 1894–95, pages 141, 142, is, to my mind, the most valuable of all inventions for the cider-maker, and it is a pity that its high price places it out of the reach of farmers and small makers. When thoroughly understood, it filters even fresh pressed juice as clear as sherry, and stops or checks fermentation, without diminishing the flavour or body of the liquor. As a rule, we can filter six or seven hogsheads a day, packing and unpacking the filter four or five times. The cider is forced through the filter by a steam-pump, at a pressure of from 10 to 25 lbs. to the square inch. It is important not to try and force it through too fast. After various experiments and alterations, we found that forty-five strokes a minute was the proper pace at which the pump should be worked. We have also a tap on the supply-pipe to regulate the flow of cider to the pump. Of course, the cider will not always go through the filter well: it requires practice, and the use of the testing-glass and saccharometer to ascertain when it is ready; but, as a rule, we find that after keeving for two or three days and skimming off the head once or twice, it goes through satisfactorily. Sometimes fresh juice will go through the day it is pressed; at other times it has to remain in the vats a week or more. When the cider is fermenting fast, it is impossible to clear it; but forcing it through the filter checks the violence of the fermentation.

TREATMENT AFTER MANUFACTURE.

From the filter the cider runs by gravitation through an india-rubber pipe into casks in the cellars below. A cider-maker cannot be too careful about his casks. The heads of all casks should be taken out every three or four years, and the casks should be thoroughly scrubbed out and scraped if necessary—all our casks are also steamed and sulphured before being filled. To sulphur a cask a strip of cardboard should be dipped into molten sulphur and dried. This match is lighted and let down by a piece of wire into a freshly washed cask, the bung is then driven in, and the match burns out filling the cask with fumes. It is, I think, better to wash out the cask again with cold water, unless it is wished to stop fermentation entirely, in which case der can be pumped into the cask at once, and will absorb .mes without giving the liquor any offensive taste. When ltered cider is in the casks it is at once bunged down, and .ll composition tube is inserted in the bung—the other end tube is taken into a bottle of water suspended from a nail cask. This acts as a perfect syphon-trap; the carbonic ;as given off by the fermenting cider escapes through the ınd forces its way through the water in the bottle, but the ınnot get back again, and the cask is effectually sealed. ithstanding all this care the cider will continue to ferment throughout the winter. All that can be done is to make ment as slowly as possible. The cellars should be kept ınd the cider should be tested occasionally with the saccha-er. If it is fermenting too fast it should be filtered again. ›ractice is to filter all the cider a second time between tmas and Lady-day, and to sulphur the casks again if sary to check the fermentation.

BOTTLING.

s, which should be done early in April, requires great care. ider should be absolutely brilliant when bottled or it will a heavy deposit in the bottles. Tastes differ as to sweet- but we bottle when the cider contains from 3½ per cent. to cent. of sugar. All bottles should be wired and laid on sides in a cool and dry cellar. Bottled cider should keep nprove for several years.

THE CHAMPION SAMPLE OF 1897.

ving now shortly sketched out the plan of manufacture ed at Lythecourt, perhaps a few details as to the parti- sample which won the Champion Gold Medal may be of st. This sample was in no way different from the bulk year's make. In fact, it was almost by a chance that it ent to the Show. Three lots were chosen by me and my an as being the pick of the cellar—the one finally selected ing among them. We did not quite agree as to which ıe best of the three, and on returning to the cellar tried ıother sample, which was finally selected and sent in for tition. The following are the details about this sample en from my Cellar Book.

of orchard where grown, alluvial on Red Sandstone; *aspect*, south; mixed; cider made on October 31st; temperature, 45°; total solids, charometer, of fresh juice, 13¼ per cent.; filtered November 7th, he saccharometer showed 13° per cent. solids; filtered a second time ember 19th, total solids being 8° per cent.; bottled on March 24th, lids being 5½° per cent.

In conclusion, I may say that since the manufacture of the Champion sample, we have made no material alterations in our operations, except reducing the speed of the pump when filtering. We have now, I think, hit upon the happy mean and, while filtering at a reasonable pace, can at the same time be certain of getting the juice as clear and brilliant as the finest sherry. I need scarcely add that in no case do we make use of any kind of preservative or flavouring matter, trusting to cleanliness and efficient filtration for preserving the cider, and to the natural flavour of the apple for taste and aroma.

IX.—*The Society's* 1897 *Exhibition of Cider.*

By F. G. FARWELL, Steward.

THE total number of entries in the cider classes at the Southampton Exhibition of 1897 was 44 as against 51 at St. Albans in 1896, and 39 at Taunton in 1895. The entries were classified as follows:—

CLASS.		ENTRIES.
	CIDER MADE IN DEVON.	
128.	—Cask of Cider (open to Landowners only)	1
129.	—12 Bottles of Cider (open to Landowners only)	2
130.	—Cask of Cider (open to Tenant Farmers only)	1
131.	—12 Bottles of Cider (open to Tenant Farmers only) ..	1
132.	—Cask of Cider (open to Cider Merchants only)	1
133.	—12 Bottles of Cider (open to Cider Merchants only) ..	1
	CIDER MADE IN HEREFORDSHIRE.	
134.	—Cask of Cider (open to Landowners only)	—
135.	—12 Bottles of Cider (open to Landowners only)	—
136.	—Cask of Cider (open to Tenant Farmers only)	1
137.	—12 Bottles of Cider (open to Tenant Farmers only) ..	1
138.	—Cask of Cider (open to Cider Merchants only)	2
139.	—12 Bottles of Cider (open to Cider Merchants only) ..	5
	CIDER MADE IN SOMERSET.	
140.	—Cask of Cider (open to Landowners only)	—
141.	—12 Bottles of Cider (open to Landowners only)	—
142.	—Cask of Cider (open to Tenant Farmers only)	6
143.	—12 Bottles of Cider (open to Tenant Farmers only) ..	6
144.	—Cask of Cider (open to Cider Merchants only)	1
145.	—12 Bottles of Cider (open to Cider Merchants only) ..	2
	CIDER MADE IN COUNTIES OTHER THAN DEVON, HEREFORDSHIRE, OR SOMERSET.	
46.	—Cask of Cider (open to Landowners only)	1
47.	—12 Bottles of Cider (open to Landowners only)	3
148.	—Cask of Cider (open to Tenant Farmers only)	—
149.	—12 Bottles of Cider (open to Tenant Farmers only) ..	2
150.	—Cask of Cider (open to Cider Merchants only)	2
151.	—12 Bottles of Cider (open to Cider Merchants only) ..	5
		44

According to the conditions of entry, the cider had to be livered at the Show-yard on or before Thursday the 13th of ay, when it was at once taken into the Cider Shed, the cases ere unpacked, and both bottles and casks set up in position.

On Friday May 14th, Mr. F. J. Lloyd, F.C.S., who conducts e Society's experimental work in connection with cider-aking, took, in the presence of the Steward, samples from ch entry in the manner described in my Report in the Society's ournal' of last year. The condition of the cider in cask, when e samples were taken, was very much better than in the revious year at St. Albans, there being little or no fermentation.

The analyses of the several entries were received from Mr. loyd on Saturday May 22nd, and were at once entered on the rds previously prepared by the Secretary and attached to each xhibit—these cards also gave such particulars as the Exhibitor upplied as to name of fruit, soil, aspect, manure used in rchards, &c.

The information on these cards is tabulated for easier reference the annexed Appendices A and B.

Mr. Beddow, of Hereford, was the Judge appointed by the ociety, and he commenced his duties on the morning of the rst day of the Show, Monday May 24th. It was at once seen at there was a marked improvement in the alcoholic strength the entries, 14 only of the 44 being disqualified for having ss than 4 per cent. of alcohol, as against 31 out of 51 exhibits St. Albans in the previous year.

Sir John Heathcote Amory was not only awarded the first ize in the two Devonshire classes for cider in cask and in bottle, en to landowners, but also the Champion gold medal for the st cider in the Show. The bottled cider which won the gold edal was of excellent flavour and particularly clean on the ngue. Some persons were of opinion that it would not keep; t on opening a bottle (which had been especially retained for e purpose) some five months after the Show, it was found to as good as on the day it was judged.

In the Herefordshire classes 4 out of the 9 entries were squalified for want of alcohol as against the whole of the tries in the corresponding classes at St. Albans. The Judge, ho was a Herefordshire man, expressed himself as much isappointed with the general character of the cider entered, nd considered it unworthy of the county. The only prizes warded were a first in the class open to cider merchants r cider in bottle, and a second in the corresponding class r cider in cask.

In the Somersetshire classes the tenant farmers were well epresented. The first and second prizes in both classes went to

Exhibitors who, as I was afterwards informed, had taken the precaution to filter their cider and had visited on several occasions the experimental station at Butleigh.

For cider made in counties other than those mentioned a first and a second prize were awarded in the merchants' classes for cider in bottle and a first only for that in cask—none of the other exhibits being considered by the Judge to be of sufficient merit to be noticed.

The advantage of having the cider analysed was again curiously demonstrated. The Judge, during his adjudication, remarked that he was convinced that certain exhibits which he specified had been doctored, and in every instance his opinion in this respect was confirmed by the table of analyses which showed that the constituents in the cider were larger than could be possibly contained in the composition of the juice of any English apple. In no case, however, was the Judge made acquainted with the analysis until after he had put the exhibit under consideration on one side as doubtful. After the judging was completed the public were permitted to sample the exhibits, and the Judge's decision in every case was thoroughly endorsed and confirmed.

In the Report last year, analyses were given of the apples from which the ciders taking first and second prizes were made, and it is much to be regretted that Sir John Heathcote Amory, who took the gold medal, was unable to give fuller particulars on his entry-card of the varieties of the fruit, as the analysis would have been most interesting. I trust, however, that he will be able to do so in future. Very few of the Exhibitors indeed stated on their cards the specific gravity of the original juice of the apples from which their cider was made; but this remark does not apply to Mr. Symes (winner of first prize in Class 142, and of second prize in Class 143), the filling up of whose card was a model to follow, showing clearly the care he had taken in the selection of his apples and in the manufacture of his cider.

The composition of the apple-juice from which Mr. Symes' cider was made is as follows:—

Name of Apple.		Sp. Gr.	Solids.	Acid.	Sugar.	Tannin.
Kingston Black	$\frac{2}{8}$	1·0672	16·60	·64	14·08	·11
Broadleaf	$\frac{1}{8}$	1·0578	14·22	·25	12·50	·30
Royal Jersey	$\frac{2}{8}$	1·0715	17 84	·35	16·12	·30
Chisel Jersey	$\frac{2}{8}$	1·0620	15·14	·20	14·49	·35
Cap of Liberty	$\frac{1}{8}$	1·0492	11·70	·80	10·63	·26

Although the acid in two of the apples is high, it is more

unteracted by the lowness of the acidity in the remain-
e varieties.
analysis of the apples from which the first prize cider in
43 was made was as follows:—

ame of Apple.	Sp. Gr.	Solids.	Acid.	Sugar.	Tannin.
Black..	1·0672	16·60	·64	14·08	·11
.. ..	1·0685	16·76	·16	16.12	·27
rsey	1·0620	15·14	·20	14·49	·35
iberty	1·0492	11·70	·80	10·63	·26

ast year's 'Journal' analyses were given of the apples
hich the cider exhibited by Mr. Tilley, who took first
n the Farmers' Class at St. Albans in 1896, was made,
may be interesting to give similar analyses of the apples
ar with which he was not so fortunate:—

ame of Apple.	Sp. Gr.	Solids.	Acid.	Sugar.	Tannin.
ury	1·0535	12·54	·18	11·76	·21
.. ..	1·0560	13·44	·43	12·34	·16
tters	1·0670	16·46	·23	14·49	·44
ls	1·0532	12·44	·49	11·11	·09
.. ..					

rtunately, it was not found possible to obtain an analysis
Dorsets, so that the above table is so far uncomplete.
her apples named appear to be somewhat deficient in
d to contain a rather high proportion of tannin.
lass 151, the cider, No. 41, was stated to be made from
s and London Pippins, and No. 42 from Blenheim Oranges
ater Pippins. These varieties would be considered, as a
ther table than cider fruit. They made, however, a most
nt beverage (No. 41 particularly), more like champagne
der; and doubtless, in years of plenty, when such apples
practically be worthless in the London market, they
with evident advantage, be converted into cider. It is
at there is yet ample scope for further investigations as
varieties of apples which can be used for cider-making.
Lloyd, in his very valuable contributions to the 'Journal'
manufacture of cider, has constantly called attention to
solute necessity of carefully sorting the apples, and
care that no mouldy or unripe fruit should be allowed to
the cider mill. In one exhibit which came under notice
ar, unripe fruit had undoubtedly been used, while in
r the cider left a peculiar taste in the mouth, as if it had

been made from mouldy apples. On submitting this latter cider to a well known learned Professor, he at once detected "mucor mucedo." The fungi known as Mucors or Moulds are extremely common on decaying bulbs, fruits, provisions, &c., and although said not to be the immediate cause of decay, they no doubt greatly accelerate putrescence when they grow upon an exposed or injured place. In this case, the Professor stated that one rotten apple with this fungus upon it would be quite sufficient to taint the whole cask. In other cases, substances had been added to the cider, which the Judge at once detected, and the exhibits were consequently rejected.

Since "trifles make the sum of human things," it may not be out of place to call attention to the fact that many of the exhibits of bottled cider might, with advantage, have been made more attractive in appearance. Whether the corks are plainly tied down, or put in gold or silver capsules, it should be done with care and neatness.

The sole object of the Society, in conducting researches and holding exhibitions in connection with cider, is to promote the industry, and to assist landowners and tenant farmers to make a good honest drink which will become popular with the English public. To further this, Exhibitors are asked to state the fruit the cider is made from, and to give other particulars. While there is every reason to believe that the majority of the Exhibitors fill up their cards honestly, and with the full determination to state nothing but facts, it is to be regretted that there were grounds for supposing that in one or two instances the names of the apples from which the cider had been made were intentionally mis-stated. It is hoped that a timely word of warning may prevent the recurrence of such a practice.

APPENDIX A.—Analyses.

No.	Name of Exhibitor.	Specific Gravity at 60° F.	Alcohol by Volume.	Acidity.	Solids per cent.	Award.
1	Sir J. H. Amory, Bart.	1·0220	4·55	·46	6·84	1st Prize.
2	Sir J. H. Amory, Bart.	1·0220	4·65	·64	6·66	1st Prize a Champi Gold Me
3	R. F. Rendell	1·0170	4·65	·50	5·71	2nd Prize.
4	H. Haydon	1·0190	4·10	·35	6·18	1st Prize.
5	H. Haydon	1·0190	4·50	·41	6·08	1st Prize.
6	J. Bearns & Co... ..	1·0250	3·40	·55	7·08	
7	J. Bearns & Co... ..	1·0200	3·78	·55	6·08	
	No entry.	..	..	..	..	
8	J. Bazley	1·0270	2·30	·30	7·45	
9	J. H. Wootton	1·0240	3·55	·50	7·05	
10	H. P. Bulmer & Co. ..	1·0080	7·12	·50	4·04	
11	H. P. Bulmer & Co. ..	1·0230	5·05	·50	7·29	2nd Prize; 1st given.
12	John Bosley	1·0260	3·30	·40	7·45	
13	John Bosley	1·0260	2·40	·51	7·16	
14	John Bosley	1·0050	5·65	·52	2·77	
15	H. P. Bulmer & Co. ..	1·0300	4·55	·89	9·00	1st Prize.
16	H. P. Bulmer & Co. ..	1·0250	5·25	·59	8·07	
..	No entry.	..	..	..	..	
17	D. J. Crofts	1·0200	6·30	·33	6·88	
18	H. J. Davis	1·0090	6·70	·38	4·11	
19	R. W. Scott	1·0240	4·10	·35	7·26	2nd Prize.
20	J. H. Symes	1·0220	4·50	·36	7·01	1st Prize.
21	W. T. S. Tilley	1·0200	5·95	·44	6·70	
22	W. T. S. Tilley	1·0160	6·10	·54	5·55	
23	D. J. Crofts	1·0210	6·15	·36	7·31	
24	H. J. Davis	1·0090	5·90	·40	4·10	
25	R. W. Scott	1·0240	4·50	·33	6·81	1st Prize.
26	J. H. Symes	1·0230	4·30	·43	7·00	2nd Prize.
27	W. T. S. Tilley	1·0220	6·15	·50	7·23	
28	W. T. S. Tilley	1·0170	6·20	·48	5·67	
29	James Watts	1·0370	2·90	·51	9·98	
30	James Watts	1·0380	2·65	·54	10·24	
31	Western Counties Wine and Spirit Co. ..	1·0220	5·65	·35	6·97	
32	H. Thomson	1·0360	3·15	·48	9·76	
33	R. F. Britten	1·0180	5·60	·93	5·91	
34	James Slatter	1·0340	2·65	·82	9·12	
35	H. Thomson	1·0400	1·90	·43	10·81	
	No entry.	..	..	..	..	
36	George Haines	1·0240	4·55	·86	7·16	
37	J. W. Simmons	1·0260	3·35	1·01	7·12	
38	R. Rout & Son	1·0180	4·80	·62	5·47	1st Prize.
39	Swanley Cider Co. ..	1·0210	5·80	·50	6·96	
40	Kingsford and Rake ..	1·0030	7·00	·58	2·63	
41	R. Rout & Son	1·0180	4·75	·69	5·85	1st Prize.
42	R. Rout & Son	1·0090	5·95	·49	3·56	2nd Prize.
43	James Slatter & Co. ..	1·0370	2·15	·95	10·00	
44	Swanley Cider Co. ..	1·0360	2·65	·42	9·76	

Class.	No.	Name of Fruit.	Information relative to Fruit.	Soil of Orchard.	General Information.
128. **Cider made in Devon.** Landowners. *Casks.*	1	Mixed	Sp. gr. of juice, 1·058.	Alluvial on red sandstone.	Sheep folded on land which is dressed with road-scrapings.
129. Landowners. *Bottles.*	2	Mixed	Fruit ripens in October. Sp. gr. of juice, 1·060.	Ditto.	Ditto.
	3	Mixed, equal proportions of Kingston Bearers, Pocket Apples, Sour Hereford, and Butter Box.	Trees blossom in May and fruit ripens in October; all good bearers and of a hardy nature.	Loam, with clay subsoil.	Orchard dressed with road-scrapings, and sheep fed there.
130. Tenant Farmers. *Casks.*	4	Mixed varieties (names not known), but very sour and harsh sorts picked out.	Sp. gr. of juice, 1·060.	Medium.	Orchards folded with sheep eating corn.
131. *Bottles.*		Ditto.	Ditto. Ditto.	Ditto.	Orchards folded with sheep eating cake.
132. Cider	6	No information given.			

Landowners. *Casks.*					
135. *Bottles.*		No entry.			
136. Tenant Farmers. *Casks.*	8	Royal Wilding (large); White Norman (small); Red Norman (small); equal quantities of each.	Sp. gr. of juice, 54. Royal Wilding blossoms latter end of May fruit ripens middle of September; good bearers every other year and hardy. White Norman blossoms in May; ripens early in September; good bearer and fairly hardy. Red Norman blossoms latter end of May; ripens latter end of September; a fair bearer and of a hardy nature.	Clay.	Sheep fed with cake and corn folded on orchard.
137. *Bottles.*	9	No information given.			
138. Cider Merchants. *Casks.*	10	Cherry Pearmain	Sp. gr. of juice, 20. Blossoms in May and fruit ripens end of October; good bearers and hardy.		
	11	Cummy Norman, one-half	Sp. gr. of juice, 21. Blossoms early in June; fruit ripens in November; good bearers and hardy.		
		Kingston Black, one-half	Sp. gr. of juice, 19. Blossoms in May; fruit ripens in November; good bearers but not hardy.		
139. *Bottles.*	12	Cummy Norman	Blossoms in May; fruit ripens in November; good bearers and hardy.	Clay.	Average weight of apples, 33 bushels to the ton.

APPENDIX B.—*continued.*

		Name of Fruit.	Information relative to Fruit.	Soil of Orchard.	General Information.
Cider made in Herefordshire. Cider Merchants. *Bottles—continued.*	13	Yellow Norman	Blossoms in May; fruit ripens in November; good bearers and hardy.	Clay.	Weight of apples, 35 bushels to ton.
	14	Strawberry Norman	Ditto. Ditto.	Clay.	Weight of apples, 30 bushels to ton.
	15	Foxwhelp	Blossoms in May; fruit ripens in October; not a good bearer or hardy. Sp. gr. of juice, 26.		
	16	Royal Wildings, two-thirds	Sp. gr. of juice, 24·5. Blossoms in June; fruit ripens in November: not a good bearer or hardy.		
		Kingston Black, one-third	Sp gr. of juice, 19·0. Blossoms in May; fruit ripens in November; a good bearer, but not hardy.		
Cider made in Somerset. **140.** Landowners. *Casks.*		No Entry.			
141. *Bottles.*		No entry.			
142. Tenant Farmers. *Casks.*	17	Royal Jersey, 4 bushels ..	Blossoms in May; fruit ripens in October; good average bearer and hardy.	Clay, loam, with clay subsoil.	Orchards dressed with farmyard manure.
		White Jersey, 2 bushels ..	Blossoms in May; fruit ripens in October; a good bearer, but not very hardy.		
			Blossoms in May; fruit ripens in October;		

	large proportion of Red Jerseys and equal quantities of others.			
19	Kingston Black, Dabinet, Chisel Jersey, Cap of Liberty. The three first in equal quantities, a few Cap of Liberty's.	Trees blossom in April and May; fruit ripens in November; Kingston Blacks good bearers; all others good and hardy.	Rich heavy soil.	Pigs run in orchard.
20	Kingston Black, two-eighths	A good bearer and hardy; average weight of apple, 2 oz.	Light clay.	No artificial manures used, but cattle wintered in orchards.
	Broadleaf, one-eighth ..	A fair bearer and hardy; average weight of apple, 4 oz.		
	Royal Jersey, two-eighths	A good bearer and hardy; average weight of apple, 2 oz.		
	Chisel Jersey, two-eighths	A good bearer and hardy; average weight of apple, 2½ oz.		
	Cap of Liberty, one-eighth	A fair bearer and hardy; average weight of apple, 1¾ oz. Sp. gr. of juice altogether, 61. The above trees all blossom in May and fruit ripens in October.		
21	Jersey, one-fourth; Old Cadbury, one-fourth; Naish's Bitters, one-fourth; Tom Puds, Doves, and Dorsets, equal quantities.	Trees blossom end of April and through May; Jersey and Naish's Bitters last; fruit ground up and cider made last week in October. Neither the Jerseys nor Dorsets are good bearers, the former being too small to be very remunerative to grow many. The Dorsets are not hardy; Jerseys and Naish's Bitters are fairly hardy; the others are hardy.	Heavy clay on blue lias.	Orchards heavily grazed with sheep, pigs, and horses, and covered with road dirt and yard cleanings. Apples not weighed, but apples in 1896 were below their usual size.

APPENDIX B.—*continued.*

Class.	No.	Name of Fruit.	Information relative to Fruit.	Soil of Orchard.	General Information.
142. **Cider made in Somerset.** Tenant Farmers. *Casks—continued.*	22	New Cadbury, one-fourth	Blossoms in May; good bearer and hardy.	Heavy clay on blue lias.	Orchards heavily grazed with sheep, pigs, and horses, and covered with road dirt and yard cleanings. Apples not weighed, but apples in 1896 were below their usual size.
		Bitter or Red Jersey, one-fourth.	Blossoms late in May; not a good bearer, but fairly hardy.		
		Horner and } equal parts	Blossoms latest of all varieties in May; a good bearer and hardy.		
		Kingston Black } equal parts	Blossoms late in May; an uncertain bearer, but hardy.		
		Gins, one-fourth	Blossoms end of April and May; a good bearer and hardy. Sp. gr. of juice, 1·065.		
143. *Bottles.*	23	Royal Jersey, 4 bushels ..	Good average bearer and hardy	Clay loam, with clay subsoil.	Orchards dressed with farmyard manure.
		White Jersey, 2 bushels ..	Good bearer, but not very hardy		
		Doves, 2 bushels	Very good bearer and hardy		
		Kingston Black, 1 bushel	Below average bearer, hardy. Trees all blossom in May, and fruit ripens in October.		
	24	Kingston Blacks, Green Jersey, Horner and Cadbury, Red Jersey and White Jersey; rather large proportion of Red Jersey, others about equal quantities.	Trees blossom in May, and fruit ripens in November; they are all good bearers in a fair season, and hardy.	Sandy loam, with clay subsoil.	Orchards dressed with mixture of farmyard manure.
	25	Kingston Black, Dabinet,	Trees blossom in April and May, and	Rich heavy	Pigs run in orchard.

		Chisel Jersey, one-fourth Cap of Liberty, one-eighth	Good bearer, hardy; weight of apple, 2½ oz. Fair bearer, hardy; weight of apple, 1¾ oz.; all blossom in May, and fruit ripens in October. Sp. gr. of juice, 61.		
	27	Same as No. 21 in Class 142	.. ..	Heavy clay on bed of blue lias.	Orchards grazed heavily with sheep, pigs, and horses, and covered with road sweepings and yard cleanings.
	28	Same as No. 22 in Class 142	.. ..	Ditto.	Ditto.
144. Cider Merchants. *Casks.*	29	Many kinds, unknown names; dominated by one sort known as Pip-Jerseys.	Trees all blossom late, and fruit ripens end of October; all are hardy. Sp. gr. of juice about 20 in lbs. per cwt. of solids.	Good holding loam on clay.	None.
145. *Bottles.*	30	Ditto.	Ditto Ditto.	Ditto.	Ditto.
	31	Kingston Blacks, Hangdowns, and Bitter Jerseys.	Trees blossom in May, and fruit ripens in September and October. All are hardy and good bearers.	Sandy.	Orchards dressed with farmyard manure.

APPENDIX B.—*continued.*

Class.	No.	Name of Fruit.	Information relative to Fruit.	Soil of Orchard.	General Information.
146. **Cider made in Counties other than Devon, Hereford, or Somerset.** Landowners. *Casks.*	32	No information.			
147. *Bottles.*	33	Bosbury Red	Blossom in May; fruit ripens in October; good bearers and hardy; weight of apple about 4 oz.	Clay soil.	Orchards dressed with farm-yard manure.
	34	Mixed	Blossoms in May; fruit ripens end of October; good bearers and hardy.	Loam.	Orchards fed with sheep.
	35	No information.			
148. Tenant Farmers. *Casks.*		No entry.			
149. *Bottles.*	36	Mixed	Blossoms in May; fruit ripens September and October; fair bearers and hardy.	Clay.	Orchards fed with sheep eating cake.
	37	Local "Bodnome," but believed to be an im-	Blossoms in May, and fruit ripens quite late: fair bearers and very hardy;	Clay; good soil.	No manure.

chants. *Casks.*		parts.	but hardy, and King Pippin, a good bearer but not hardy. Crows Egg, good bearer and hardy. Sp. gr. of juice, 1·0173.		
	39	Mixed fruit all bought.			
151. *Bottles.*	40	French } Shropshire } equal parts ..	Trees blossom in May and June, and fruit ripens in October; good bearers and hardy. Sp. gr. of juice, 1·055.	Part loam on limestone.	Ditto.
	41	Russett } London Pippin } equal parts.	Trees blossom in May, and fruit ripens in October; fair bearers and hardy. Sp. gr. of juice, 1·0273.	Clay.	
	42	Blenheim Orange, 3 parts; Water Pippin, 1 part.	Trees blossom in May, and fruit ripens in October; good bearers and hardy. Sp. gr. of juice, 1·0170.	Clay.	Ditto.
	43	Mixed red—hand-picked ..	Trees blossom in May, and fruit ripens in October; good bearers and hardy. Sp. gr. of juice, 1·060.	Various; mostly stiff soil.	
	44	Mixed fruit—all bought.			

X.—*Reports upon the Society's Experiments for the Improvement of Permanent Pasture.*

INTRODUCTORY OBSERVATIONS BY THE ACTING-CHAIRMAN OF THE EXPERIMENTS COMMITTEE (MR. ACLAND).

It will be remembered that in previous Reports upon the Society's experiments for the improvement of permanent pasture, the view was expressed that this series of experiments should be continued for such a period of years as might suffice to justify the inference of certain practical conclusions upon the various methods adopted with a view to such improvement. Hopes were also entertained that certain principles, already to some extent generally accepted, might thus receive further illustration tending either to confirm or to throw additional light upon their applicability. It was also anticipated that opportunity would be afforded for the wider and more systematic study of the growth and habits of various grasses and the effects of different manures upon them respectively; knowledge which, once acquired, could hardly fail to be of value in guiding the efforts of those who have difficulties to contend with in laying down land to grass or in keeping grass land up to the mark.

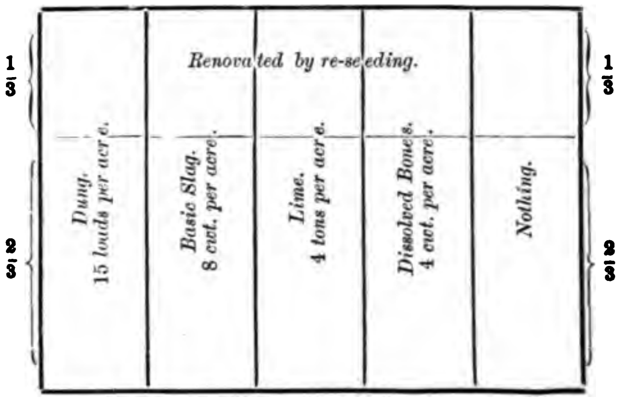
If we cannot as yet come to any very certain conclusions or point to any startling results, it must be borne in mind that this is but the second year of the experiments, and that not only must the operation of such methods as are open to us be, by the nature of things, slow, but it must also be liable to be retarded by untoward seasons (whether wet or dry), and it is quite certain to be much affected in various directions by the characteristic vicissitudes of the English climate. Whilst we hope gradually to become better able to form some general conclusions of practical value, at present we can but cautiously indicate the direction in which such conclusions may with most probability be looked for.

The six experimental sites were visited by Mr. Rowbotham in May or July, and five of them again in October, and his Reports, condensed as closely as possible, are appended, together with such Reports as have been furnished by the Stewards in charge respectively of the different sites.

In addition to these Reports, the botanical visitor has, with the sanction of the Committee, contributed a Report upon some sites upon the Digby Estate in the neighbourhood of Sherborne, which he was, by the courtesy of Mr. Rawlence, the agent in charge, invited to visit. The Committee desire to record their grateful sense of obligation to both Mr. Rawlence and Mr. Rowbotham for the interesting addition thus made, which iot fail to be of value when the time comes for summing up results. Attention should also be directed to a feature ch is, as far as regards this 'Journal,' to some extent new, which bids fair to be of considerable practical interest and ie. It was felt by the Committee that any report upon the ject of "teartness" in connection with the experiments upon No. 6 would, if they did not take account of the recent elopments of science in bacteriology with regard to the ases of animals, be incomplete. Application was, therefore, le (with the consent of the Council) to Prof. Crookshank, of ig's College, London, and he most readily and cordially ed the resources of his laboratory and the skill of Dr. vman, the demonstrator, at the service of the Committee. investigation was naturally one of great complexity, and very special and technical nature. Dr. Newman, however, furnished a very careful Report of such results as he has so been enabled to attain. Some difficulty occurs in rendering eport upon a subject so special in its character intelligible interesting to readers unacquainted with that branch of nce to which it refers, but it is hoped that no one who ls the account given by Dr. Newman of his investiga- will fail to perceive the promise contained therein of ortant revelations as to the cause and nature of the effects 'teartness" of land.

XPERIMENTAL SITE NO. 1, AT TALATON, OTTERY ST. MARY, DEVON.

wned by Sir John Kennaway, Bart., and occupied by George Daw, of Larkbere Farm, Ottery St. Mary. An area acres has been treated thus :—



5 Plots—1 acre each.

ABRIDGED REPORT OF THE BOTANICAL VISITOR.

Date of visit, July 15th, 1897.

On both the Basic Slag Plot and the Dissolved Bones Plot, especially on the former, a fine growth of Clover is to be seen, and the stock have cropped the herbage of these plots exceedingly close.

The Dung Plot exhibits the fullest growth at the present time; but this is probably due to the preference shown by stock for the sweeter herbage of the plots dressed with slag and bones.

The Lime Plot shows a somewhat finer growth than is to be seen elsewhere, but the herbage is scanty.

With regard to the renovated portion, a fair sprinkling of Timothy is observable; but, with the exception of a few plants of Cocksfoot, I am not able to perceive that any other of the seeds have come up, and it is probable that, if they germinated at all, they did not survive the drought.

The conclusions arrived at from previous inspections seem to be modified at the present time in reference only to the basic slag and dissolved bones. Otherwise, I do not perceive any marked difference in the relative proportions of grasses and weeds, with the exception of Yorkshire Fog, which has decreased to a marked extent over the manured plots.

REPORT OF THE ACTING STEWARD IN CHARGE (MR. W. ASHCROFT).

Date of visit, September 18th, 1897.

There was a very thick bottom of grass over the whole of the lower part of the field where the plots are situated; the field had not been heavily stocked during the summer and had just been rested, so that though there were a few Dog's-tail and Agrostis Bents about one hardly noticed them, owing to the close and luxuriant appearance of the bottom grass.

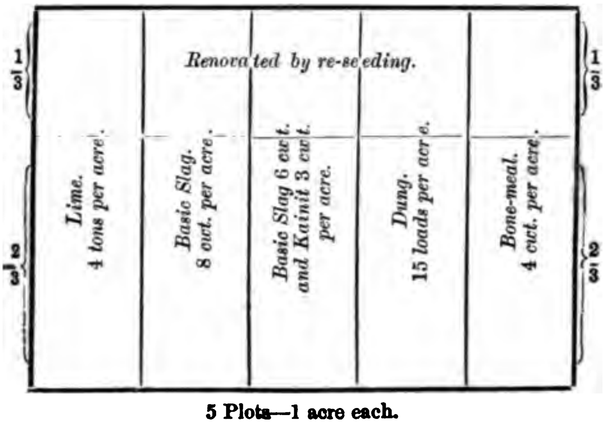
I remarked to the tenant that I thought he had never seen that field look so well, and he agreed with me. As it had been down about ten years it is but reasonable to look for improvement, though the upper part which is wetter does not improve in the same ratio. As to the plots themselves, there was no doubt as to the sweetening and improving effect of the basic slag, and the bones came second; but the Lime Plot was distinctly disappointing, having more weeds and being left much lighter by the stock. It is hardly necessary to state that the Dunged Plot was not quite so well eaten. On the renovated portion I could see no difference. I subsequently walked with the tenant over some of his poorer pastures, and was surprised to see such poor stuff in that district with its "grass climate."

ıose fields being for the most part beyond the running of lung cart, are left to take care of themselves, and I sug- d to the Experiments Committee that if such fields could reetened and *permanently thickened* in herbage at a moderate a valuable result would be demonstrated. Slag being ıently suited to the ground, I was asked to mark out three rate pieces in different fields which I did on October 27th, two plots of one acre each and one half-acre plot; these since had 8 cwt. of slag applied per acre. It is proposed epeat half the quantity of slag two or three times in the se of the next five years, making the total application ːwt. or a ton, costing, at 45*s*. a ton, 36*s*. or 45*s*. per acre, ːh does not amount to as much as one application of dung.

Experimental Site No. 2, at Killerton, Devon.

wned by The Right Hon. Sir T. D. Acland, Bart., and pied by Mr. Lewis Tout, of Broadclyst, Devon.

n area of 5 acres has been treated thus:—


Renovated by re-seeding.
Lime. 4 tons per acre.
Basic Slag. 8 cwt. per acre.
Basic Slag 6 cwt. and Kainit 3 cwt. per acre.
Dung. 15 loads per acre.
Bone-meal. 4 cwt. per acre.
1/3
2/3
1/3
2/3

5 Plots—1 acre each.

Abridged Report of the Botanical Visitor.

ıte of visit, July 16th, 1897.

e manured plots show a marked improvement as compared the rest of the field. On the Lime Plot a remarkable ılation of Hard Fescue is observable. The Basic Slag Plot, he plot manured with basic slag and kainit, especially the ·, have much more Dutch Clover than is to be seen else- e in the field, and with this there is a considerable proportion ıllow Suckling, which I did not see last year. The herbage

of both of the Basic Slag Plots has been very closely
by stock.

The Dung Plot, which in consequence of the rejection
herbage by stock made the best show last year, exhibits
coarser growth at the present time than is to be seen
rest of the plots. The Bone-meal Plot, however, sh
appreciable difference from the unmanured portion of the

The abundance of Fiorin-grass at this season is very
and the manures do not seem to have affected it in any
but the quantity of Yorkshire Fog, which is also an al
constituent of this pasture, has been much diminished
Lime Plot.

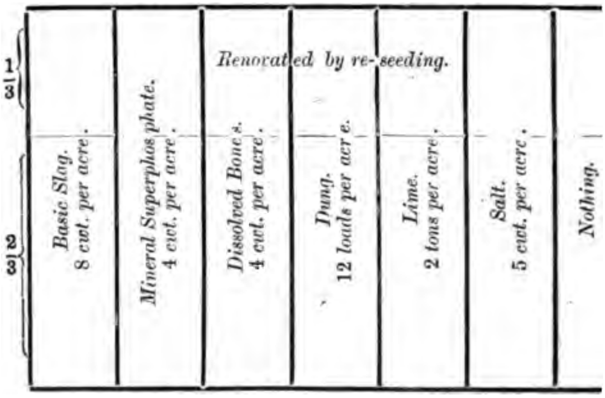
Apparently the drought of last year destroyed t
seedlings which resulted from the renovation of a po
the site.

It will be seen by reference to Dr. Voelcker's Report
(*vide* Society's 'Journal,' vol. vi. p. 182), that the present
seem to bear out his conclusions, notably as regards t
ciency of lime in the soil; whilst the most favourable
perhaps, have followed the application of kainit with ba

EXPERIMENTAL SITE NO. 3, AT WANSTROW, SOMER

Owned by W. Hurle Clarke, Esq., and occupied
Richard H. Yeoman.

An area of 7 acres has been treated thus:—


1/3
2/3
Renovated by re-seeding.
Basic Slag. 8 *cwt. per acre.*
Mineral Superphosphate. 4 *cwt. per acre.*
Dissolved Bones. 4 *cwt. per acre.*
Dung. 12 *loads per acre.*
Lime. 2 *tons per acre.*
Salt. 5 *cwt. per acre.*
Nothing.

7 Plots—1 acre each.

ABRIDGED REPORTS OF THE BOTANICAL VISITOR.

Dates of visits, July 12th and October 12th, 1897.

Last year the dung showed the greatest improvement was observed that weeds and grasses had alike been stimulated by its action. This year the first place must be given to the basic slag. The herbage of this plot comprises an abundant growth of White and Red Clover, Yellow Suckling, Bird's-foot Trefoil, and Meadow Vetchling. Previous to the application of the manures, Meadow Vetchling and Bird's-foot were both scarce in the field, whilst the presence of Yellow Suckling altogether escaped my observation at the period of my first visit. The leguminous character of the herbage noticed at the present time is accompanied by a diminution in the proportion of worthless weeds.

On the Dissolved Bones Plot the herbage is very good, and the Dung Plot likewise maintains a full growth, though the weeds are here very plentiful. The action of the lime this year has been to bring on the finer grasses, such as the Fescues, and to discourage the coarser kinds. The salt, however, does not seem to have produced any result.

The seeds sown last year probably did not germinate until the fall, and thus escaped the drought. Timothy-grass is very plentiful on the renovated portion, generally, while Cocksfoot is most abundant on that portion of the renovated strip on which the basic slag has been put.

The relative proportions of some of the other grasses have undergone a slight alteration. Quaking-grass is rather more abundant than formerly, but Couch seems to be less plentiful. Yellow Oat-grass is very plentiful, as was the case last year. There is also plenty of Hassock-grass in places; and, except upon the Lime Plot, there appears to be no diminution of Yorkshire Fog.

Whilst the proportion of weeds is still great, it is satisfactory to note that the quantities of Carnation-grass and Field Wood-rush, which were very plentiful formerly, have been remarkably diminished by the action of the manures.

At the later visit in October, it was demonstrated that the basic slag, the mineral superphosphate, the dissolved bones, and the lime, had each produced effects more or less marked, as compared with the unmanured portion of the field; but the basic slag had, unquestionably, maintained its lead in regard to the general improvement effected. The proportion of weeds had been generally diminished upon the manured plots; but this was most strikingly shown in the case of the basic slag, the feeding-value of the herbage upon which plot had thereby been greatly augmented—a fact which was further evidenced by the appreciation shown for the herbage by stock.

REPORT OF THE ACTING STEWARD IN CHARGE (MR. W. A

Date of visit, September 16th, 1897.

The field had been cut for hay, and the tenant info that the crop on the Slag Plot was better both in qu quantity than the others.

At the time of my visit the cows were grazing the s and, judging from the way in which the stock were I came to the conclusion that the lime had not up exercised any sweetening effect. The Basic Slag decidedly most liked and showed the best bottom, th slag, bones, and superphosphate, lying, if anything, on side of the field, were all three rather preferred to tl I could see no effects from the salt.

The portion that was harrowed and renovated las improved, but as only that portion was well harro difficult to say how much of the improvement is du harrowing, and how much to the seeding.

What young plants there are ought to be bett lished, and show themselves to more advantage next s summer than they do in the autumn aftermath. Dr. was of opinion that the salt and superphosphate s repeated on half the plots, which has been done since n

It must always be remembered that such a stiff fiel with its thin grass bottom, varies greatly in its aspect to the time of year.

In the autumn bare places are filled up with young grass has naturally thickened, and seen in late winte spring one would hardly believe it to be the sa Despite the difference in the plots being to a grea obliterated when I saw them in the autumn, the B Plot bore a quite sufficiently distinctive appearan entitled to the highest place.

EXPERIMENTAL SITE NO. 4, AT SHERBORNE, DORS

Owned by J. K. D. Wingfield Digby, Esq., M.P., and [illegible] Mr. T. H. Miller, Black Marsh Farm, Sherborne. [illegible] acres has been treated thus:—

Road Scrapings.	*Nothing.*	*Basic Slag.* 8 *cwt. per acre.*	*Re-* *in Spri*

4 Plots—1 acre each.

ABRIDGED REPORT OF THE BOTANICAL VISITOR.

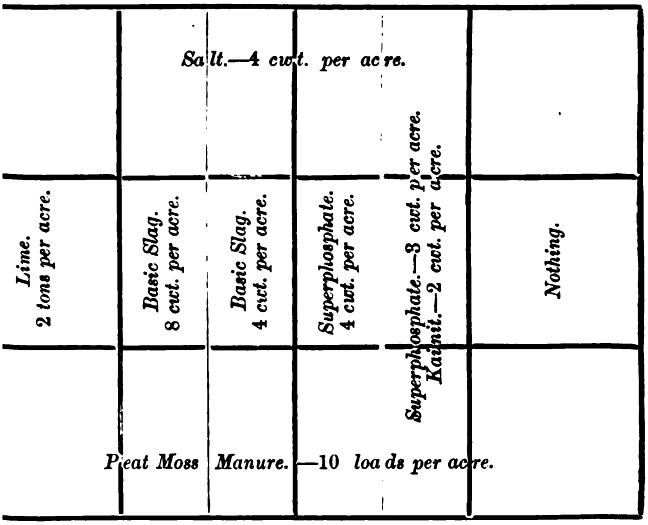
of visit, July 14th, 1897.

er the favouring conditions of a growing season an im-
ient in the herbage of this field is generally noticeable.
eds, however, are still much too visible. The Basic
lot exhibits a marked advance upon the Road-scrapings
ı the development of a fine growth of White Clover; but
f the manured plots compare favourably with the un-
ed portion of the field. The basic slag has here, as
ere, greatly stimulated the growth of Yellow Suckling
with White Clover.

in these respects, I do not observe any material differ-
ı the relative proportions of the plants as exhibited at my
ıs inspections.

ERIMENTAL SITE NO. 5, AT WEST GRINSTEAD, SUSSEX.

ied by Rev. J. Goring, and occupied by Mr. John Reeve,
mpions, West Grinstead, Horsham, Sussex.
area of 4 acres has been treated thus:—



ABRIDGED REPORTS OF THE BOTANICAL VISITOR.

es of visits, May 12th and October 8th, 1897.

the beginning of this year the half-plot which last year
own with 4 cwt. of basic slag, received an additional

4 cwt., which has thus brought it up to the level of the other half, which received 8 cwt. of basic slag in one application. On the first named half-plot there is a very close and heavy growth of Dutch and Alsike Clover and Trefoil, forming a sharp line of demarcation between the two half-plots. There can be no doubt that the two separate dressings have produced the best results.

With regard to the Lime Plot, it does not seem that sufficient time has yet elapsed to enable the herbage to recover from the discouraging effects of the drought of last year.

One-half of the Salt strip has been resown with salt this year; but the extent to which this has operated in diminishing the quantity of Bent-grass is not at the present time appreciable.

The Superphosphate Plot makes a fairly good show, but the Clovers are not nearly so abundant here as on the Basic Slag Plot. I am unable to perceive that any benefit has accrued from the addition of kainit upon one-half of this plot.

On the Dung strip the grasses are well up, but as the season has advanced, the other plots have, with the help of the early rains, shown a tendency to level up to the dung, which this year, with the more favourable conditions operating beneficially for the minerals, is not so marked in its effects, and certainly falls behind the basic slag in the production of early bottom growth and stimulation of Clover.

Foxtail shows a decided increase this year upon the manured plots, as compared with the two preceding years. Bent, on the other hand, seems generally to have decreased as a result of the manuring. The proportion of Moss is much less upon the manured plots than elsewhere in the field.

When the site was visited in October, it was seen that the improvement produced by the basic slag had been well maintained, but that the best effects were to be seen on the 8 cwt. per acre half-plot; though, as has been already mentioned, in May the half-plot which had received the two separate dressings made the better show. A point of special interest noticed on this occasion was the remarkably thick seedling growth of Trefoil which was present in the field as the result of the shedding of the seeds of this plant before the hay was carried.

There was a considerable quantity of seedling grass to be seen upon the plots, but the levelling up was chiefly due to the development of the Trefoil, with Fiorin-grass, Cocksfoot, and Yorkshire Fog. The proportion of the last-named grass seemed to have been somewhat diminished by the action of the lime, which, on the other hand, appeared to have favoured the development of the finer grasses.

REPORT OF THE STEWARD IN CHARGE (MR. W. ASHCROFT).

Dates of visits, April 30th, July 2nd, and September 23rd, 97.

On my first visit on April 30th, my notes on the plots were it "the half-plot where the slag had been applied at two sepa-e dressings (4 cwt., winter 1895–96, 4 cwt., winter 1896–97), is decidedly better than the other half, and it and the dunged ip looked about equal; Superphosphate and Kainit Plot ghtly better than the Superphosphate alone; no effect from ne; the application of salt decidedly prejudicial."

On July 2nd, when the grass was quite ready to cut, ought, in t, to have been cut a few days before, rather than as it was, few days later, the Slag Plot on both halves (8 cwt. one essing, and 4 cwt. two separate dressings), and the dunged ip showed a good crop; the herbage very largely consisting a big growth of Trefoil and Alsike Clover; in fact, Trefoil was nsiderably in evidence over most of the plots, but not to ything like the marked degree shown on the Slag Plot.

The tenant and myself estimated the crop on the Slag Plots id Dung strip to be quite 2 loads an acre, the average of the her plots being not more than a load, if that. My previous tes on the prejudical effects of salt and the non-effect of lime ere borne out by the subsequent growth of the crop.

One point of interest in my visit on September 23rd, when e aftermath had been grazed down, was the somewhat con-adictory evidence shown in the two halves of the Slag Plot. the spring, and when the grass was ready to cut, the half which the slag had been applied at two separate dressings oked the best, whereas on September 23rd the half on which it id been applied in one dressing (8 cwt., winter 1895–96) had rtainly the better appearance in bottom herbage.

Owing to the lateness of cutting and the subsequent August ins, there was quite a thick seeding of Trefoil on the ground.

The prejudicial effects of salt had disappeared. There is no ubt that on these poor weald clays basic slag is the manure apply to improve and sweeten the herbage, and it should rther be observed that this is the second season since the plication of both dung and basic slag (so far as the 8 cwt. one dressing is concerned), and that the crop from the slag is second year hardly differs from that taken when the dung id been put across all the plots.

It would be an interesting object-lesson to compare the cost the dung with the cost of the slag, their produce, and the sult at the end of five years. The dung did not cost less ian 50*s*. an acre, whereas for the same expenditure on the

Slag Plot you could give during the next three years another 12 cwt. of slag.

"What is wanted" is the *cheapest* method of improving poor pastures; in one sense, "anything and everything" will help to mend grass, but when we come to do it to any extent it all resolves itself into a question of £ *s. d.*, and that is in these days very often the one thing wanting.

EXPERIMENTAL SITE NO. 6, AT YEOVILTON, SOMERSET.

Owned by J. K. D. Wingfield Digby, Esq., M.P., and occupied by Mr. Ernest Haine, of Yeovilton, Ilchester, Somerset.

EXPERIMENTS ON "TEART" LAND.

As stated in the Society's last issued Report, it had been intended to investigate the effect of Soft versus Hard Water, but it having been apparently proved that the water from the above-named land was not hard nor of a purging nature, and did not differ materially in composition from the river water, this portion of the inquiry was abandoned.

(*a.*) *Manurial Experiments.*

An area of 4 acres has been treated thus:—

Dung. 15 *loads per acre.*	*Basic Slag* 8 *cwt. and Kainit* 2 *cwt. per acre.*	*Nothing.*	*Road-Scrapings and Lime.*

4 Plots—1 acre each.

ABRIDGED REPORTS OF THE BOTANICAL VISITOR.

Dates of visits, July 14th and October 13th, 1897.

There can be no doubt as to the improvement effected by the manures, though the best results are to be seen on the plot manured with basic slag and kainit, where the Clovers, also, have been greatly encouraged. The herbage of the Dung Plot, though heavy, is coarse, whilst the dressing of road-scrapings and lime does not seem to have produced any effect.

The field has been mowed, and Mr. Haine informs me that he obtained a fairly good crop from it. Cocksfoot, which succumbed last year in consequence of the drought, has this

ned its ascendancy, and this grass, together wit
rm the principal ingredients in the herbage.

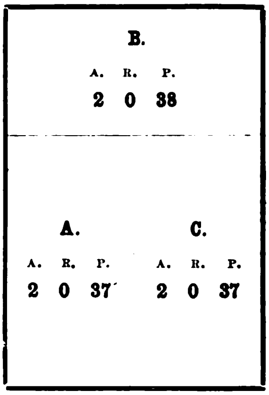
.) *Experiment on Early and Late feeding of Grass.*

ABRIDGED REPORT OF THE BOTANICAL VISITOR.

' visit, October 13th, 1897.
rbage of this field is very coarse, and the grow
character—the clumpiness being due to the
' Cocksfoot which obtains wherever the dropp
e lain, and the consequent avoidance of such
stock. The grasses comprise Cocksfoot, in
, a large proportion of Bent-grass, with Meadov
Rye, and Hard Fescue in smaller and varying
e rest of the herbage comprises Red and White
weeds as Milfoil, Earth-nut, Autumnal Hawkt
, the last named being very abundant. The h
fairly even, does not seem to include any
ature. The soil is a stiffish clay, and althou
e time of my visit, there were no signs of S
pasture, in fact, is distinctly grassy, and seem
affording a very fair supply of food.

nent on the utility of Cake-feeding in preventing "sc
m the beginning and in stopping it when once begun.

lots A, B, and C were set out as follows:—



was used for the purpose of ascertaining wh
at conditions, the land in its natural stat

"teart." Plot C was used for feeding with cake; and Plot was kept for feeding later on in the year.

Report of the Steward in charge (Mr. A. F. Milton Druce)

As my Stewardship did not commence until August last, whe I succeeded Mr. Dyke, my Report must mainly refer to wha has taken place since then.

On the 1st of May last four Devon cows were purchased b Mr. Haine, the tenant, at Taunton Market at a total cost o 52*l.* Two of them were put on Plot C, each having a dail allowance of 5 lbs. of cotton cake, and the others were put o Plot A without any cake. Unfortunately, about the end o June, one of the cattle on Plot A had to be sold, as it wa suffering from mood, or protrusion of the uterus—a no uncommon complaint in the neighbourhood—but this wa not due to scouring. It was replaced by another anima (purchased at the same time as the others for 15*l.*), which ha been grazing in a meadow (mild land) in Mr. Haine's occu pation.

The produce of Plot B was made into hay in June, and th plot was then grazed with the cattle which had not had cak and were previously on Plot A. The rough grass on Plot was cut.

On August 1st the cake given to the cattle on Plot C wa increased to 10 lbs. for each.

Previous to being sold or slaughtered, each animal wa weighed four times with the following results:—

		Animals on Plot C.					Animals on Plot A.				
	1			2			3			4		
	cwts.	qrs.	lbs.	cwts.	qrs.	lbs.	cwts.	qrs.	lbs.	cwts.	qrs.	lbs.
August 3	10	1	14	8	3	0	10	1	0	8	[illegible]	0
September 24 ..	11	0	0	9	1	9	10	1	14	7	3	7
November 8 ..	11	2	7	10	0	0	11	0	0	7	3	0
" 15 ..	11	3	0	10	0	0	11	1	14	7	2	14

Nos. 1 and 2 (on Plot C), fed with cake, did not scou neither did No. 3 (on Plot A), which replaced the one sol but No. 4, which had been on Plot A all the time, scoured, a lost weight in consequence.

The following table shows the monthly increase or decrea in weight of cattle:—

Plot C.	Animal No. 1.			Monthly Increase.			Animal No. 2.			Monthly Increase.		
	cwts.	qrs.	lbs.	cwts.	qrs.	lbs.	cwts.	qrs.	lbs.	cwts.	qrs.	lbs.
Aug. 3	10	1	14		..		8	3	0		..	
Sept. 24	11	0	0	0	2	14	9	1	9	0	2	9
Nov. 8	11	2	7	0	2	7	10	0	0	0	2	19
„ 15	11	3	0	0	0	21	10	0	0	0	0	0
		..		1	1	14		..		1	1	0

Plot A.	Animal No. 3.			Monthly Increase.			Animal No. 4.			Monthly Decrease.		
	cwts.	qrs.	lbs.	cwts.	qrs.	lbs.	cwts.	qrs.	lbs.	cwts.	qrs.	lbs.
Aug. 3	10	1	0		..		8	0	0		..	
Sept. 24	10	1	14	0	0	14	7	3	7	0	0	21
Nov. 8	11	0	0	0	2	14	7	3	0	0	0	7
„ 15	11	1	14	0	1	14	7	2	14	0	0	14
		..		1	0	14		..		0	1	14

The sale of the four beasts resulted in a loss of 17*s.* 6*d.*

I have gratefully to acknowledge the help received from Mr. E. A. Rawlence and the ready assistance rendered by Mr. E. E. Haine and Mr. E. Damphney in carrying out these experiments.

The intestines of the two animals on Plot A were sent to Dr. Newman, whose Report is appended.

BACTERIOLOGICAL REPORT BY GEORGE NEWMAN, M.D., D.P.H., &c. DEMONSTRATOR OF BACTERIOLOGY, KING'S COLLEGE, LONDON.

On August 23rd, 1897, I received from Mr. E. E. Haine, of Yeovilton, samples of (1) soil, (2) grass, (3) scour. The bottle containing the sample of water was broken in transit—another sample of drinking water arrived at the laboratory August 26th.

A thorough and detailed examination of these four samples was made as follows:—

1. *Surface Soil.*—This was lumpy and contained many small rootlets. A certain quantity of it was taken, minced up small and submitted to the following treatment:—

(*a.*) * 0·5 gramme thoroughly mixed in a sterilized flask with 18 fluid ozs. of sterilized water, and three Koch's plates † were made in gelatine containing 1 c.c., 0·5 c.c., 0·1 c.c. respectively. These were incubated at 68° F.*

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* The French system of measurement has been used as that generally in vogue for fine quantities. A cubic centimetre (c.c.) would be about twenty "drops."

† A Koch's plate is a method of investigation by which a small quantity of the substance to be examined is added to a given quantity of nutrient medium, and is then spread out upon a flat dish or plate, and after solidification is incubated at a degree of temperature and moisture which is favourable to the growth of bacteria.

(*b.*) Two test tubes of nutrient beef broth were inoculated with the soil and incubated at blood heat (98·5° F.), and room temperature (60° F.). Sub-cultures were made on gelatine and agar, and two guinea-pigs were inoculated.

(*c.*) A large number of microscopic preparations were made from the solutions of the soil and from the cultures, and examined.

The following micro-organisms were detected:—

Quantitative Examination.—Many thousands per gramme.

Kinds of Micro-Organisms.—The following may be taken as samples:—

Bacillus subtilis,† the Hay bacillus, growing as short rods or threads, very common, and widely distributed; not pathogenic or disease-producing.

Bacillus mycoides, a larger rod, found in cultivated soils; like anthrax in some respects, but innocent.

Bacillus flavescens, small rods, found in marshy water.

Bacillus fluorescens non-liquefaciens, short delicate innocent rods, very common.

General Remarks.—The soil is not highly polluted, organically; nor does it appear to contain any micro-organisms which can directly affect the matter in hand.

Physically, what was received was non-porous, cakey, and tenacious.

Within a month neither of the guinea-pigs showed any sign of disease.

2. *Grass.*—Of this there were two samples—that from scouring land and that from non-scouring land. Both were treated separately as follows:—

(*a.*) A portion of each was washed in sterilized beef broth, and two Koch's plates were made in gelatine, 1 c.c. and 0·5 c.c. respectively. From the resulting growth sub-cultures were made.

(*b.*) A portion of each was soaked for three days in 18 fluid ozs. of sterilized water, from which plates were made, which in due course was sub-cultured.

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[*] *Incubation* means placing the gelatine and the micro-organism (= the *culture*) in a chamber where the desirable temperature and moisture for its growth will be obtained. Some organisms prefer a high temperature, *e.g.* that of the blood, 37° Centigrade (C.), or 98·5° Fahrenheit (F.). Others prefer a low temperature like 20° C., or 68° F.

[†] It may be well just to state that a *Bacillus* is a rod, longer than it is broad. These are frequently so small that 10,000, end to end, would not extend to more than an inch. A *micro-coccus* is a round cell, requiring high powers of the microscope to see. A *spirillum* is a wavy thread-like organism. These three forms practically comprise all the lower bacteria. Both lower and higher bacteria are classified as vegetables, not animals.

(*c.*) A portion of each was placed in broth and incubated at ·5° F. and 68° F., and sub-cultured.

(*d.*) Microscopic preparations of the various solutions and ib-cultures were made and examined.

The following micro-organisms were found:—

Quantitative Examination.—So numerous that it was impossible to make en an approximate estimation.

The chief kinds present in scouring land grass:—

Bacillus fluorescens liquefaciens, short round-ended rods, very common; nocent.

Micrococcus flavus, small round cells, in twos and threes; innocent.

Bacillus viscosus, Bacillus aquatilis, Bacillus subtilis, Bacillus liquefaciens, c.

Bacillus saprogenes, and some putrefactive *micrococci.*

Remarks.—There was a very marked difference indeed etween the grass from the scouring land and that from healthy nd in the degree, and rapidity of onset, of putrefaction. everal of the above organisms afford ample explanation of ıtrefaction.

3. *Scour* (manure from scouring cows) was investigated as llows:—

(*a.*) A platinum needle-loop full of the excreta was mixed ith sterilized beef broth and incubated at 98·5° F. From this ixture a healthy guinea-pig was inoculated (2·5 c.c.).

(*b.*) Two Koch's plates in gelatine were also made (1 c.c. and ·5 c.c.).

(*c.*) Sub-cultures were made upon gelatine and agar, both om the excreta itself and from the broth. These were incuated at 68° F. and 98·5° F. A guinea-pig was inoculated from ie agar.

(*d.*) A number of microscopic preparations were made from ie excreta and from the cultures.

The following micro-organisms were detected:—

There must have been even millions of micro-organisms in ie smallest quantities of the manures sent to me.

Putrefactive germs abounded, and the scour was much more lvanced in every way in putrefaction than the healthy manure. was very watery, yellow-green in colour, of an extremely ul odour, with many bubbles of gas (carbonic acid or ethane), but having no blood and no parasites. It conined:—

Bacillus fluorescens putidus, assisting to produce both the putrefaction d colour (green).

Bacilli liquefaciens, fuscus, flavescens, and *erythrosporus* were amongst e common organisms present.

The chief feature, however, was the enormous number of a more virulent group, including *Bacillus coli communis*, and the *Proteus* family. Without entering into unnecessary bacteriological facts, *Bacillus coli communis* calls for some detailed remark. It is the chief ally of the virulent bacillus of enteric fever (typhoid), and is held by many bacteriologists to be a cause of diarrhœa. It is, however, always present in the intestine, and therefore, except under special circumstances or conditions, it does not cause diarrhœa. It produces an acid fermentation of lactose (milk sugar), and thereby curdles milk, and it has the further power of producing methane gas (Klein). It splits up peptones and the products of advanced digestion, and produces *indol* in the lower part of the intestine. In all diseased conditions of the intestine its numbers are greatly increased, and when present with typhoid bacilli the *B. coli* assumes a much higher degree of virulence than when alone. So much is this the case that some authorities hold that *B. coli* really takes some considerable share in the production of the characteristic symptoms of typhoid fever.

Enteric (or typhoid) fever is not, as is well known, a disease affecting animals like it does man, though it undoubtedly has its analogies amongst the lower animals. *B. coli* is probably a normal inhabitant of the intestines of man, cattle, pigs, dogs, &c. It is not the same as typhoid, though when present in great numbers it may produce a similar effect, and under favourable circumstances can take on a high degree of virulence. Dr. Cautley * reports that the virulence of *B. coli* is definitely intensified by association with non-pathogenic micro-organisms, especially so with yeasts. In the same official Report, Dr. Klein states that *B. coli* is "a powerful decomposer of albumen," and produces poisons (toxins) as a result of its growth—and the effect of these poisons is a fall of temperature, vomiting, purging, and collapse. The post-mortem signs are a congested intestine, containing very watery contents.

The most characteristic activity of this group is that of fermentation of carbo-hydrates (i.e. sugar, starch, &c.), the micro-organism itself producing a ferment which first produces lactic acid, and then breaks that up into less complex substances. In health the *B. coli* is non-virulent, its force is spent upon the process of fermentation; but in conditions of inflammation in the digestive tract this process being in abeyance, the bacillus will become virulently pathogenic (Peckham).† Professor Booker has recently made an extensive investigation into the

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* Local Government Board Report, "Medical Officer's Supplement," 1895-96, p. 282.

† 'Journal of Experimental Medicine,' Vol. ii., No. 5, 1897, p. 557.

isms causing diarrhœa in children, and his view is inter-
g in this connection. He says, " no single micro-organism
nd to be a specific exciter of the diarrhœa, but the affection
nerally to be attributed to the result of the activity of a
ber of varieties of bacteria, some of which belong to well-
vn species and are of ordinary occurrence and wide distribu-
the most important being the *streptococcus* and *proteus*
ris." * "The first step," he adds, "in the pathological
ss is probably an injury to the epithelium of the intestine
excessive fermentation, from toxic products of bacteria or
other factors."

r. Klein † seems to hold very much the same view, for he
eves that the presence in the bowel of enormous numbers of
li or of *Proteus vulgaris* may result in active disease. Food
ld be the likely channel of infection, and if this was cooked
erly, *or* the stomach retained its healthy and usual acidity,
germs would be in all probability not virulent, or be killed.
" let this polluted food be uncooked, and let there be
lerangement of the stomach whereby its natural acidity
mpaired, then the passage of a large number of *B. coli*
f *Proteus vulgaris* into the intestine might, owing to their
rmous capacity for multiplication at body temperature, have
ially deleterious effects." (*Klein.*)

roteus vulgaris.—Found in putrefying animal substances:
htly bent bacilli, liquefying gelatine, motile, no spores.

Water.—This physically pure water was examined :—
a.) By Koch's plate method, 1 c.c., 0·5 c.c., 0·1 c.c., of the
er being added to sterilized gelatine, plated and incubated.
-cultures and microscopic preparations were made.
he following micro-organisms were detected :—

uantitative Examination.—7000 micro-organisms per cubic centimetre.
inds present :—

spergillus glaucus	Moulds.
enicillium glaucum	
accharomyces.—Yeast.	
acillus liquefaciens	All innocent ordinary micro-organisms, constantly present in waters.
acillus fluorescens liquefaciens	
acillus aquatilis	
acillus fluorescens	
icrococcus citreus	

Remarks.—The seven thousand bacteria per c.c. are too many
a potable water, which ought not to contain more than 500,
erwise the water is not a bad one.

John Hopkins Hospital Report, Vol. vi., pp. 251, 253.
Local Government Board Report. "Medical Officer's Supplement,"
5-96, p. 195, *et seq.*

On November 9th, I went to Yeovilton, and in company with Mr. Milton Druce (one of the Society's Experiments Stewards), Mr. R. Ware, M.R.C.V.S. (Martock), and Mr. E. E. Haine, examined the experimental land and the scouring cows. This gave me an opportunity of also making a microscopic examination of very recent excreta for the purpose of searching for *Amœba coli.* A number of cultures were also made in gelatine of scouring and non-scouring excreta. It was mutually agreed by those present that the investigations would be increased in value by a careful post-mortem examination of animals, either dead from scouring, or killed during the acute stage. I pointed out, in correspondence, to the Chairman of the Experiments Committee, that such an investigation of an animal might, or might not, yield fruitful results, but that a bacteriological research could not be considered as in any degree complete without some such examination. It will be obvious that as a matter of fact only a very extended series of animal examinations could be accepted as altogether reliable, or as forming sufficient data for valid conclusions. However, one was better than none. On the certification of Mr. Ware, that a certain animal was scouring from "teart" lands, and on the agreement of those present to the same effect, it was decided to kill the cow for purposes of investigation.

On November 18th, the abomasum, liver, spleen, a mesenteric gland, small intestine, ileum, and rectum of a scouring cow were received at the laboratory well packed, sealed, and labelled, from Mr. Robert Ware, M.R.C.V.S., being the products of a post-mortem at Yeovilton. A bottle of urine and a bottle of blood from the scouring animal were also received.

These articles were bacteriologically examined as follows:—

Blood.—Three Koch's plates were made, sub-cultures and microscopic films.

Urine.—Two Koch's plates (November 17th), sub-cultures and microscopic films.

Liver.—A typical piece was cut out and hardened [*] in alcohol and ether, and later in celloidin.

A small quantity of serum was extracted before hardening, and was inoculated with broth and gelatine, and incubated.

Spleen.—Ditto.

Excreta from rectum, ileum, and abomasum were examined in each case microscopically stained and unstained, and cultures were made in gelatine and beef broth.

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[*] *Hardening* is a process of preparation for section cutting. When a piece of tissue is sufficiently hardened, it is frozen, and *extremely* thin sections of it are cut with a razor on a microtome, and are then ready for staining, to detect any bacteria in the tissue. Unless tissues were thus hardened it would be impossible to cut sections thin enough to examine under a microscope.

Small intestine, ileum, abomasum, and mesenteric gland were l hardened for further examination.

The following results were obtained:—

General Condition.—Good. Contents of abomasum were kaline in reaction, very watery and yellowish-green in colour. he mucous membrane throughout the alimentary tract was)mparatively healthy.

The abomasum was slightly congested, and showed several nall, depressed, injected ulcers (each about the size of a sixence). These were cut out and hardened.

Parasites.—None whatever. No *strongyli.* No *psorosperms.*

Micro-Organisms:—

1. *Bacillus coli communis* (for description, see above) in the blood, urine, ecretion from liver, fluid and excreta from abomasum, ileum, and rectum. 'resent in great numbers.
2. *Proteus vulgaris.*—In the blood and excreta from ileum, &c. An ctively moving bacillus present in putrid meat infusions, very common in utrefying animal matter. Pathogenic for rabbits, but not for larger animals.
3. *Bacillus citreus cadaveris.*—In the blood. Occurs frequently in animals orty-eight hours, or more, after death. Non-pathogenic.
4. *Bacillus fluorescens liquefaciens* (see above).—In the blood, and ecretion from liver.
5. *Streptococcus liquefaciens vel coli gracilis.*—In the blood (?), and excreta rom the rectum. These occurred more or less extensively in the rectum, but nly very rarely in the blood. They are chains of small round cells, and are on-pathogenic.
6. *Micrococcus ureæ.*—In the urine. Found, it is said, in air; certainly ery common in alkaline urines. Round cells, singly or in pairs.
7. *Micrococcus ochroleucus.*—In the urine. Small round cells, producing a narked yellow colour in culture which is soluble in alcohol.
8. { *Bacillus albus cadaveris.* / *Bacillus putrefaciens coli.* } Both in the excreta, where they are common.

It is not suggested that there were not other organisms present, but it is affirmed that the above were the important germs. The *Proteus* group, *Bacillus coli,* and *Bacillus fluorescens iquefaciens* were particularly common and abundant. It would be expected that a large number of ordinary putrefying germs would be present.

Notes on the Report.—I may perhaps be allowed to make some remarks upon the general question of scouring, and upon the above data. These observations cannot be taken as final, for the data are not sufficient in quantity to justify any very valid conclusions. I have simply made a careful and thorough bacteriological examination of various substances and tissues submitted to me—the series of experiments, in my judgment, have been of a too limited nature to place beyond dispute the facts which they have partially or wholly brought to light.

They are, however, I think of a nature not unworthy of consideration in this somewhat mysterious disease.

It will be admitted that the very marked diarrhœa (scouring) and wasting which characterises certain animals feeding on "teart" lands is produced by one of two causes, either:—

1. Organic. — Parasites, micro-organisms, vegetable organic poisons;

or

2. Not organic.—Salts (in soil, water, or grass): conditions of temperature and moisture of soil, &c.

Many veterinary authorities have from time to time put forward the hypothesis that scouring amongst cattle on "teart" land is due to *parasites*. Perhaps the best statement in behalf of this view is that of Professor Penberthy, of the Royal Veterinary College, London. In a most able article on the subject* he claims that there is much evidence in support of a parasitic cause, whilst not denying that excess of purging salts or luxuriant immature herbage may be responsible for some cases. But if these (and not parasites) were the cause, then surely horses and sheep grazing upon the same land should suffer in the same way from the same salts or herbage. After most carefully studying Mr. Clarke's Essay in the Society's Annual 'Journal' for 1855, and the extremely exhaustive and able Report in the 1862 'Journal,' by the late Dr. Voelcker, and collecting evidence from all available sources, I must admit that I share Professor Penberthy's view that the probabilities are in favour of an *organic* rather than inorganic cause.

Bearing this in mind, special search was made in passing for (1) *Amœba coli*; (2) *Psorosperms*; (3) *Strongyli*. They are clearly not "bacteria"; but the writer felt that no harm could be done by an examination for such parasites as have been proved to be more or less associated with the alimentary tract, and with diarrhœa.

The *Amœba coli* is one of the lowest of all parasites, and possesses the simplest structure. It is a round or oval mass of protoplasm, and occurs in the large intestine in tropical dysentery. It may also occur in the liver. Outside the body these rapidly break down and disappear. Hence examination of excreta must be undertaken *immediately* after it has left the body. Kartulis and others hold that it may cause dysentery. Scouring is not strictly dysentery. Still these parasites were searched for on November 9th in the "hanging drop" preparation on a warm stage. They were not present in any of a considerable number of preparations.

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* "Journal of Comparative Pathology and Therapeutics," Vol. vii. No. 3, p. 260 (Sept. 1894). John Penberthy, F.R.C.V.S.

Psorosperms were also examined for in the intestine, and in e prepared sections of liver. They were not found.

Strongyli, as suggested by Professor Penberthy,* and as so lmirably described by Professor Mac Fadyean,† were searched r in stomach, intestine, and lungs. They were not, however, esent.

No parasites of any kind (excluding Bacteria) were found ther in the excreta or in the tissues of the body.

Dr. Klein has recently described ‡ a micro-organism which he olds to be the cause of very acute diarrhœa (simulating cholera) ı the human intestine. It is a spore-bearing bacillus, not rowing in oxygen (*anaërobic*), liquefying gelatine, producing a ıarked odour in gelatine and milk, and with many characteristics that liken it to *malignant œdema* on the one hand, and to . *butyricus* on the other, but differing from both in several important characteristics. Spore-bearing bacilli are rare in the ntestine. Klein states that *B. mesentericus* and *B. amylobacter* re "the only two known species" occurring thus. He proposes herefore to name this new bacillus *B. enteritidis sporogenes* (the pore-bearing bacillus of the intestine). It has been impossible n the present circumscribed investigation to examine very fully or this new micro-organism, which appears to possess such very narked power of producing diarrhœa. I have already remarked hat upon the subculture and microscopic preparations which ıave been made it has been demonstrated beyond question that vhatever else there may be, there was present when the tissues eached the laboratory abundant sporulation, but the evidence ointed to an aërobic spore-bearing bacillus, and not an anaërobic ne. It yet remains to isolate and cultivate the spore-bearing acilli which have been found, and see how far they meet)r. Klein's description of *B. enteritidis sporogenes*. More than his cannot at present be said.§

I have in the above results of the bacteriological examination tated in some detail what facts seemed relevant to the matter n hand, with regard to *Bacillus coli communis* and *Proteus vul-aris*. Such is the evidence, but I cannot commit myself to any lefinite conclusion on such a limited area of investigation. I hink, however, that there is not a little evidence from Mr. Clarke's Essay, Dr. Voelcker's Report, Professor Penberthy's Article, and

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[*] "Journal of Comparative Pathology and Therapeutics," Vol. vii. No. 3,). 261 (Sept. 1894). John Penberthy, F.R.C.V.S.

[†] *Ibid.* 1896, p. 314.

[‡] Local Government Board, 1895–96. "Report of the Medical Officer" (Sir R. Thorne Thorne), Appendix B., No. i., p. 200 *et seq.* (E. Klein, M.D., F.R.S.)

[§] If it is found on further investigation that any more light may be thrown on the matter I may perhaps be permitted to send a note to the 'Journal' for next year.—G. N.

the Comparative Studies in Diarrhœa, by a number of authorities, that after due weight has been given and eliminations made, the real cause of this emaciation and diarrhœa amongst cattle on certain lands is due to an *organic* agent and factor, or set of factors, and not inorganic. I am further inclined to the view that "the soil of scouring land" (Voelcker), and possibly a condition of the grass—"a larger proportion of soluble saline matter, organic acids, and other combinations" (Voelcker)—act not directly as the sole agents in the scouring, but act either on the cow, producing a favourable nidus for organic agents or upon those organic agents themselves. Therefore, in a sentence, I should venture to express my opinion that the true cause of the scouring is an organic poison, but that there are inorganic conditions affecting the animal or the poisonous agent, or both.

I may take this opportunity of saying a few words, though they are only indirectly connected with the above Report, upon the relationship between the soil of the injurious land and the micro-organisms of diarrhœa.

For some considerable time it has been noted that certain diseases flourish in men and animals living upon certain soils. For example, Sir George Buchanan and Dr. Bowditch, for England and the United States respectively, have pointed out the intimate relationship between the dampness of soil and consumption (tuberculosis of the lungs), and Pettenkofer has traced a definite relationship between the rise and fall of the ground water with pollution of the soil and typhoid (enteric) fever. Ballard has proved what is now frequently demonstrated, that the summer rise of diarrhœa mortality does not commence until the mean temperature of the soil recorded by the four-foot earth-thermometer has attained somewhere about 56° F., and the decline of diarrhœa coincides with the decline of soil temperature. Nor is the influence of the atmospheric temperature, or the temperature of the superficial layers of the earth, apparent until the temperature of the four-foot thermometer has risen to 56° F. This temperature (56° F.) is therefore considered as the "critical" four-foot earth temperature—that is to say, the temperature at which certain changes (putrefactive, bacterial, &c.) take place in the pores of the earth with the consequent development of the diarrhœal poison.

After a very elaborate and prolonged investigation on behalf of the Local Government Board, Dr. Ballard formulates the causes of diarrhœa in the following conclusions* :—

(*a*.) The essential cause of diarrhœa resides ordinarily in the uperficial layers of the earth, where it is intimately associated vith the life processes of some micro-organism not yet detected r isolated.

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* Supplement to the "Report of the Medical Officer of the Local Government Board," 1887, p. 7.

(*b.*) That the vital manifestations of such organism are lependent, among other things, perhaps principally upon onditions of season, and in the presence of dead organic matter which is its pabulum.

(*c.*) That on occasion such micro-organism is capable of getting abroad from its primary habitat the earth, and having become air-borne obtains opportunity for fastening on non-living organic material and of using such organic material both as nidus and as pabulum in undergoing various phases of its life history.

(*d.*) That from food, as also from the contained organic matter of particular soils, such micro-organism can manufacture, by the chemical changes wrought therein through certain of its life processes, a substance which is a *virulent chemical* poison.

Much has been done since 1887 to establish and confirm Ballard's researches; and it will be observed that his final opinion is sufficiently elastic to include, as a cause of diarrhœa, chemical products of bacteria manufactured *either within or outside the body.*

Scouring soils, according to the analyses of the late Dr. Voelcker, contain a comparatively large percentage of (1) organic matter; (2) oxides of iron and alumina; (3) insoluble siliceous matter; (4) carbonate of lime. Whereas *peat,* which did not scour, though containing much more organic matter, contained less of the other named constituents, especially mineral substances. The non-scouring propensities of peat have been attributed solely to its lack of scouring salts, but it must be remembered also that peat has an acid-reaction which would be highly inimical to many pathogenic micro-organisms; on the other hand its high percentage of organic matter might so abundantly meet the requirements of the saprophytic bacteria that—as in sewage—specific micro-organisms would be crowded out by competition.

Again, it is said, "that the use of manures aggravates the mischief," but that "the complaint ceases almost entirely after the first November frosts;" both of which facts would appear to point in the direction of an organic agent as the cause of the disease.

It appears to me that in relation to scouring, and from what has already been proved respecting the chemical and physical characteristics of scouring soil, the factors to be most carefully considered in studying the question are: (1) the subsoil, its consistence, pollution, temperature, &c.; (2) the moist position of the ground water; (3) the action of bacter in the soil and in the living tissues and fluids of the ani

But alongside such considerations, the *animal eleme* speak, must not be lost sight of. In addition to any condition, it is obvious that the accidental cause, wha may be, requires a particular animal condition to prod scouring. Horses and sheep are apparently but little on the self-same patch of land which produces scou cattle. So long as any such difference exists we have in of not only some external agent, but some condition animal's tissues favourable to the disease.

EXPERIMENTAL TRIALS WITH BASIC SLAG.

ABRIDGED REPORT OF THE BOTANICAL VISITOR.

In July and October last I visited a number of sites u Digby Estate, in the neighbourhood of Sherborne, Dors which, at the instance of Mr. Rawlence (Mr. Digby's trials had been made with basic slag. The nature of experimented upon in almost every case was such as wou under the denomination of poor, cold clay; and it w some of the poorest of these examples that the most results had been produced. The history of these plots the date of my first visit was given to me by Mr. Ra who stated that the manure was sown in March, 189 half-acre plots, at the rate of 8 cwt. per acre. The drought of the summer of 1895 prevented any result observed during that year, and as the season of 18 proved to be an extremely dry one, there were practic results worth noticing until the commencement of the year.

The fact that the results have only become st apparent in this, the third year of the experiments, s me to point to the following conclusions, viz.:—(1) On soils the full effects of basic slag are not apparent unti siderable period has elapsed; but (2) the development effects may be, and probably is, hastened or retarded condition of the season following the application of the and (3) that it may perhaps be assumed that the be effects of the slag are not only maintained over a ve siderable period, but that there is also a marked tend increase observable in these effects from year to year, would seem to point to a gradual improvement in the conditions of growth, and probably also to the produc a condition of food-availability in the soil which is specially favourable to the growth of leguminous plants.

The stimulation of the Clovers and their allies would doubtless be accompanied by, if it did not exactly imply, a discouragement of the worthless weeds, such as has been observed in several of the sites. As regards the effect of the basic slag upon the grasses, the evidence at present derived from these experiments, and from those conducted by the Society, is not quite so conclusive as in the case of the leguminous herbage; but, so far as I have been able to observe, it does not appear that the stimulation of Clovers has been, in any case, at the expense of the better grasses of the pasture.

I now select for detailed report one or two of the more notable examples of these trials :—

Messrs. Dunford, Lillington.—The first field chosen for trial upon this farm has a stiff clay top-soil, resting upon the Forest Marble of the Oolitic Series, and is a typical example of the rough upland pasture met with in this neighbourhood. It is in great part overrun by brambles, and the soil is mainly held by such weeds as Hawk's-beard, Hoary Rib-grass, or Plantain (*Plantago media*), Common Bird's-foot, Field Daisy, Carnation-grass, &c. A few grasses are present in varying proportions; thus, Dog's-tail is abundant, as is usual on such poor pastures, and Fiorin (*Agrostis alba, var. stolonifera*) and Hard Fescue are both plentiful, whilst in lesser quantities there are Cocksfoot and Quake-grass. There is also a sparse growth of White Clover. None of the better grasses, however, are in a flourishing state; the small amount of Cocksfoot to be seen being very stunted. Large patches consisting entirely of Carnation-grass and Hoary Plantain are met with all over the field.

This is the normal state of the herbage in the field, and its character sufficiently indicates the need for improvement as regards its feeding quality. In this respect the basic slag has brought about the most remarkable change. Upon the plot in question scarcely a plant of Carnation-grass is now to be seen ; the White Clover has been greatly stimulated, and there is a very good bottom-growth, consisting chiefly of Fiorin-grass. Cocksfoot seems to be distinctly benefited, for it has not only increased in numbers, but has assumed a much coarser growth. Another grass which seems to have been greatly encouraged is Hard Fescue. Hoary Plantain, on the other hand, does not appear to be much affected by the altered conditions of growth; but the diminution of other weeds is most marked —though this is perhaps partly attributable to the preference shown by the stock for the herbage of this plot.

In another field upon this farm, having a similar soil, and with a herbage of somewhat similar character, the basic slag has worked an even greater change in the relative proportions of useful and worthless plants. The chief difference, however, in the two cases is the larger proportion of Clover in the second field.

A third plot upon this farm is situated in a field having a rather steep slope, and characterised by a sparse herbage, with a profusion of Ox-eye Daisy, Self-heal, and Cudweed. Here the effect of the manure has been to bring on a very fine head of Red Clover, and to eliminate, to a great extent, the Ox-eye Daisy and some of the other weeds.

In a field adjoining the last, but occupying the crown of the hill, a fourth experiment has demonstrated the apparent futility of applying basic slag to soils of a certain character. The clay of the lower field here gives place to a capping of sand upon the bottom rock, and consequently the soil loses its stiff, impervious character, and the results of the basic slag have here been almost nil. From this particular case, and also from others which we have observed, it seems that special attention should be given to the nature of the sub-soil in deciding upon the advisability or otherwise of applying basic slag in a particular locality, and also in judging the comparative effects of the manure in different localities. It may frequently happen that in two contiguous fields the top-soil in the one case may have so thinned out as to bring the sub-soil (which is often, as in this case, the equivalent of the bottom-rock) nearer or close to the surface, and thus to alter materially the character and behaviour of the soil in reference to the action of the manure.

Mr. Bird, Stockbridge.—On this farm four separate experiments have been tried—two upon the Oxford Clay, and two on the stiff, cold clay above the Forest Marble. The results, as I am informed by Mr. Rawlence, have in all cases been very marked. I personally inspected one of the plots situated upon the Oxford Clay, affording, as I venture to think, a very instructive example of the capabilities possessed by basic slag for improving poor soils of this character. The field in question, though on a gentle slope, and artificially drained, is normally wet, and after a few hours' rain is, I am informed, little better than a bog. The herbage is very scanty, the grasses consisting chiefly of Fiorin and Yorkshire Fog. With these are abundantly associated Carnation-grass, Field Wood-rush, Common Rush, Marsh Cudweed, and Buttercup. Moss is also exceedingly prevalent. Clovers are only sparsely represented. The field is one which has been allowed to go to grass, no seeds whatever having been sown upon it.

The effects of the dressing of basic slag are chiefly noticeable n the production of a good plant of Clover, and the complete limination of the Carnation-grass, Rush, and Moss, with a narked reduction in the quantity of Buttercup. The differnce between the manured plot and the portion of the field djoining it could be detected directly one stepped from the ne to the other. The Fiorin-grass and Yorkshire Fog have enefited to a large extent by the manure, and the bottom-rowth, as compared with that of the rest of the field, is xcellent. The fact that the normal herbage of the field does ot include any grasses of good quality is sufficient to account or their absence from the manured plot.

The Clovers specially stimulated by the basic slag were Red and White Clovers (especially the latter), and Yellow Suckling. Except in one instance it did not appear that the basic slag had promoted the growth of the grasses to an equal extent with the Clovers, but rather that it had supplied the necessary stimulus which was lacking in order to enable the Clover-plant to displace the worthless weeds of the pasture, and thus to convert a portion of a poor clay pasturage, characterised by thin, wiry, and weedy herbage, into a comparatively rich feeding ground.

REPORT OF THE CONSULTING BOTANIST
(MR. W. CARRUTHERS, F.R.S.).

With reference to the Grass Experiments generally the Consulting Botanist says:—

"The only point that suggests a remark is as to the operation of the Farmyard Manure. From my own observations it appears that the vigorous growth of the herbage during the first year after applying the manure is rejected by the stock, where there is a choice of food, because of the presence of the manure, and that this latter has so far disappeared in the second year that the stock freely eat the herbage. The fertilising influence of farmyard manure on the vegetation remains for a long time after the application of the manure.

"The experiments should be continued, as the relative cost of the manure and treatment cannot be determined until there is some evidence of the exhaustion of the manures. The proportionate cost of a manure which when once applied continues to be efficacious for several years, is of course much less than that of one whose efficacy disappears in a year or two.

"I think it would be well to fence in a strip along the plots, as much as would give a quarter of an acre in each plot, and convert the produce into hay. This would exhibit more accurately the actual and relative value of each treatment."

CONCLUDING OBSERVATIONS BY THE ACTING-CHAIRMAN OF THE EXPERIMENTS COMMITTEE (MR. ACLAND).

It will be remembered that from the experiments of 1896 an inference was drawn that the continued use of farmyard manure was favourable to the production of an abundant grass crop, rather than one of high value for feeding purposes. Further, that the use of lime, even on soils upon which it would ordinarily be valuable, might, under certain circumstances resulting from an exceptional season, be temporarily prejudicial. Preference was expressed for the application of lime in the form of basic slag, and a caution, suggested by Mr. Rowbotham, was recorded against hasty deductions from the result of single seasons.

With respect to the first of these inferences, the experience of the past year emphasises the necessity of caution in the use of farmyard manure where sweetness, in addition to thickness, of herbage is desired. Its tendency (noticed in 1896 as supporting the Rothamsted results) to encourage the growth of the coarser grasses is confirmed, whilst, in several instances, it appears to have given more encouragement than other manures —such as those favourable to leguminous plants—to the growth of weeds.

If, at this stage, a conclusion of a general character may be hazarded, it may be said, that where heavy crops of hay are aimed at, the use of farmyard manure is advantageous; whereas when grazing and close cropping by stock are desired, Clovers and the finer grasses are better encouraged by the use of basic slag, lime, dissolved bones, or superphosphate.

It must, however, be remembered that in the second year after the application of farmyard manure, a more vigorous growth of herbage may be made available for grazing, and may possibly be found to compensate in some respects for the difference in the cost of applying that manure as compared with the others.

The results of the attempts at renovation by means of seed have, as was anticipated in consequence of the drought which ensued upon the sowing, turned out very disappointing. This points to the necessity of such experiments as relate to renovation, to the application and testing of manures, &c., being of prolonged duration, if any valuable results are to be achieved.

The results of the bacteriological examination conducted by

Dr. Newman, though not in his opinion sufficient at the present stage to warrant him in coming to a definite conclusion, seem nevertheless to afford amply sufficient justification of the new departure taken by the Committee in drawing attention to the pathological aspect of the effects of "teartness" in land. It is therefore to be hoped that it may be possible to carry this investigation sufficiently far to warrant some valuable practical conclusion which may not only prove serviceable to occupiers of such land, but may also be capable of much more extensive application.

The remarkable effects reported by Mr. Rowbotham of the application upon the Digby Estate of basic slag upon stiff cold clays, together with the negative results upon sandy soil, are such as to encourage the Society in their efforts to convince practical farmers of the possibility of effecting real improvement upon land which has failed as pasture, or which has never had a fair chance on account of the character of the soil. They afford also an additional testimony to the desirability of proceeding in such matters by way of experiment—a lesson which it is one of the objects of the Society to inculcate.

Last year's work decidedly tends to strengthen the belief that a continuation for several consecutive years of the present series of experiments will produce results gradually more and more definite, and therefore more and more valuable.

In this hope the Committee venture to repeat the appeal, made in their last Report, that their readers will endeavour to place a few more sites at their disposal, so as to enable them still further to vary their experimental illustrations.

List of Plants referred to in the foregoing Reports.

Grasses.

Bent, or Fiorin (*Agrostis sps.*).
Cocksfoot (*Dactylis glomerata*).
Couch (*Agropyrum repens*).
Dog's-tail (*Cynosurus cristatus*).
Foxtail (*Alopecurus pratensis*).
Hard Fescue (*Festuca duriuscula*).
Hassock-grass (*Deschampsia cæspitosa*).
Perennial Rye (*Lolium perenne*).
Quaking-grass (*Briza media*).
Smooth Meadow-grass (*Poa pratensis*).
Timothy, or Cat's-tail (*Phleum pratense*).
Yellow Oat-grass (*Avena flavescens*).
Yorkshire Fog (*Holcus lanatus*).

Clovers.

Alsike Clover (*Trifolium hybridum*).
Bird's-foot Trefoil (*Lotus corniculatus*).
Meadow Vetchling (*Lathyrus pratensis*).
Red Clover (*Trifolium pratense*).
Trefoil (*Medicago Lupulina*).
White, or Dutch Clover (*Trifolium repens*).
Yarrow, or Milfoil (*Achillea Millefolium*).
Yellow Suckling (*Trifolium minus*).

Weeds.

Autumnal Hawkbit (*Leontodon autumnalis*).
Buttercup (*Ranunculus sps.*).
Carnation-grass (*Carex panicea*).
Common Rush (*Juncus effusus*).
Earth-nut (*Conopodium denudatum*).
Field Daisy (*Bellis perennis*).
Field Wood-rush (*Luzula campestris*).
Hawk's-beard (*Crepis virens*).
Hoary Plantain (*Plantago media*).
Marsh Cudweed (*Gnaphalium uliginosum*).
Ox-eye Daisy (*Chrysanthemum Leucanthemum*).
Self-heal (*Brunella vulgaris*).

XI.—*The Society's Dairy and Farriery Schools.* By THOS. F. PLOWMAN, Secretary and Editor.

DAIRY SCHOOLS.

THE travelling Butter School which, since June 27, 1893, the Society had conducted on behalf, and at the cost, of the Devon County Council, was carried on up to October 18 last, when the Society handed it over to the County Education Committee, who were then in a position to undertake the control of it. During the period named, the School visited 47 centres, and gave instruction to 846 pupils, 777 of whom attended a full ten days' course.

A Cheese School has been carried on by the Society during the past year, on behalf, and at the cost, of the Somerset County Council, at Fenswood Farm, Long Ashton, upon the estate of Sir J. H. Greville Smyth, Bart., the occupier of the farm and premises being Mr. R. Harding.

The usual arrangements were made with the tenant for the use and control of his dairy, the supply of milk from his cows, and the boarding and lodging of pupils in his house.

The School was supervised by Mr. G. Gibbons, the teacher being Miss E. J. Cannon. The School had also the advantage of the advice and experience of Mr. H. Cannon, of Milton Clevedon.

Twenty-five pupils attended the School, sixteen of whom received four weeks', five three weeks', and four one week's instruction.

An Experiment Station was, as usual, attached to the School, the cost, with the assistance of a Government grant, being defrayed by the Society. Detailed accounts of the work carried on there during the past year will be found further on in this volume.

Some of the Cheese, mainly that made during May and June, last year at Long Ashton, was not of the usual high quality, but the remainder realised 60*s.* per cwt. of 112 lbs., Messrs. Hill Brothers, of Evercreech, being the purchasers.

With the object, more especially, of ascertaining the cause of the taints in the milk and defect in the Cheese, it has been arranged for the School to be held again at Fenswood Farm. With the knowledge and experience gained during the past year, the Committee hope and believe that they will be able to prove the possibility of making cheese of uniformly good quality on this particular farm, and will at the same time succeed in tracing out the causes which militated against this in 1897. They feel assured that, under any circumstances, the course proposed will result in the obtaining of information which, both from a practical and a scientific point of view, is likely to be valuable.

The School will therefore be re-opened at Fenswood Farm on March 25.

Since the establishment of its Butter and Cheese Schools in 1888 and up to the end of 1897, the Society has, in conjunction with County Councils and other public bodies for whom it has acted, expended the sum of 22,712*l.* in the promotion of technical instruction in dairying through the medium of these Schools. Even this sum by no means represents the total expenditure, for it does not include the cost of hiring and fitting up buildings for the travelling Butter Schools, and other liabilities undertaken by local bodies—such as the County and District Committees—co-operating with the Society. During the period named, 169 centres in sixteen different counties have been visited by the Society's migratory Butter Schools, and 3,084 pupils have received instruction therein. Stationary Cheese Schools have been located for seven months each at nine centres, viz. eight in Somerset and one in Dorset, and have been attended by 404 pupils.

At the Society's Annual Exhibition, which opens on May 25 next at Cardiff, special Prizes (particulars of which will be found on pages xciv.-xcvi. of the Appendix to this volume) will be given for Cheese made by pupils who have attended any of the Society's Schools.

FARRIERY SCHOOL.

The Travelling Farriery School, carried on by the Society for the Somerset County Council, has been well attended by pupils during the past year.

The accompanying table shows the places visited and the number of pupils at each since the starting of the School:—

Centre.	Year.	School		No. of Pupils.
		Opened.	Closed.	
Taunton	1895	April 8	Aug. 5	32
Wellington	,,	Aug. 7	,, 31	7
Milverton	,,	Sept. 2	Sept. 14	3
Wiveliscombe	,,	,, 16	Oct. 25	12
Williton	,,	Oct. 28	Dec. 6	12
Dunster	,,	Dec. 9	,, 20	5
Allerford	1896	Jan. 6	Jan. 17	5
Bridgwater	,,	,, 21	March 14	13
Nether Stowey	,,	March 16	April 10	8
Kilve	,,	April 13	,, 24	5
Wells	,,	,, 27	June 2	7
Glastonbury	,,	June 3	,, 16	2
Ashcott	,,	,, 17	,, 30	4
Catcott	,,	July 1	July 14	4
Langport	,,	,, 15	Aug. 29	10
Ilminster	,,	Aug. 31	Sept. 26	7
Chard	,,	Sept. 28	Oct. 9	5
Crewkerne	,,	Oct. 12	Nov. 14	10
Martock	,,	Nov. 16	,, 28	4
Yeovil	,,	,, 30	Dec. 23	8
Castle Cary	1897	Jan. 11	Jan. 23	2
Shepton Mallet	,,	,, 25	Feb. 6	2
Oakhill	,,	Feb. 8	,, 20	4
Frome	,,	,, 22	March 13	6
Radstock	,,	March 15	,, 29	1
Bath	,,	,, 29	May 10	10
Cutcombe and Exford	,,	May 18	July 3	8
Bridgetown	,,	July 5	,, 17	3
Dulverton	,,	,, 19	,, 31	5
Highbridge	,,	Aug. 3	Aug. 21	4
Weston-super-Mare	,,	,, 23	Oct. 2	9
Banwell	,,	Oct. 4	,, 16	3
Yatton	,,	,, 18	Nov. 12	6
Wrington	,,	Nov. 15	Dec. 8	6
Flax Bourton	,,	Dec.		6
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The School has not only been a success in point of attendance, but the pupils have shown a genuine and intelligent interest in their work, and have not hesitated to express themselves as thoroughly satisfied with the instruction given.

The School is supervised by the Society's Farriery Steward (Colonel Best), and the Veterinary Surgeon attached to it is Mr. G. H. Elder, M.R.C.V.S., of Taunton. The latter lectures to the classes upon the anatomy of the horse's foot, and upon other subjects connected with farriery, and acts as general adviser upon the work of the School.

The instructor is Mr. W. B. Blackall, master smith, late of Coleshill, Highworth, Wilts, who, previous to his appointment to the post, had won twenty-one prizes and several high commendations at shoeing competitions held by the Bath and West and Southern Counties Society and other Societies.

The instruction is restricted to those who are already in the trade. This is essential, not only to avoid jealousy and ill-will, but because the instruction can only be given effectively, in the necessarily limited number of lessons, to those who have already acquired a fair knowledge of ordinary shoeing. The aim is to improve old hands rather than to teach beginners.

A course of instruction, the fee for which is 2*s.* 6*d.*, consists of ten lessons. These are given at six o'clock in the evening, as the pupils, having their ordinary work in the daytime, cannot conveniently attend before that hour. A class consists of four pupils, and, as the same pupils cannot always attend night after night, it is generally arranged to have two different classes, which are taken on alternate nights. The pupils are shown the correct method of shoeing every kind of horse they are likely to have to deal with, and how to adapt shoes to abnormal conditions of feet. A typical collection of shoes and hoofs is always on exhibition at the School, and the explanations given of them are much appreciated.

Forges, iron, and all the necessary tools and appliances are provided by the Society, and are contained in a van, which is moved about from place to place, so that the School may be brought within easy reach of the smiths of any particular locality in the county.

At the conclusion of a certain number of courses in a district, a competition for prizes and certificates is held, open exclusively to pupils from the classes, and, in order to encourage regularity of attendance, only those who have attended at least eight times are entitled to compete.

The Registration Committee of the Farriers' Company admit winners of First Prizes in these competitions to the Official Register *free of charge*, on their satisfying the judges that they have a fair knowledge of the structure of the horse's foot, while other competitors who satisfy the judges of their competency are admitted on payment of the usual fees (viz., £1 for masters, aud 5*s.* for doormen).

During the past year competitions were held at the places named, when the following pupils were successful.

January 7, at Yeovil:—

NAG HORSE SHOEING.

1st prize.—J. H. Miller, Dowlish Wake, Ilminster.
2nd prize.—H. Pomeroy, Key, Yeovil.
Highly Commended.—F. Purse, Yeovil; and C. Churchill, Chaffcombe, Chard.
Commended.—J. Gane, Curry Rivell; J. H. Shire, Combe St. Nicholas, Chard; A. Paull, Merriott, Crewkerne; F. Spinks, White Lackington, Ilminster; D. J. Slade and S. Bartlett, Crewkerne.

CART HORSE SHOEING.

1st prize.—E. Paull, Merriott, Crewkerne.
2nd prize.—G. Paull, Curry Mallett, Taunton.
Commended.—H. Harris, Allowenshay, Chard; and W. Slade, Crewkerne.

August 14, at Exford:—

NAG HORSE SHOEING.

1st prize.—A. Newton, Exford, Dunster.
2nd prize.—J. S. Lock, Exford, Dunster.
3rd prize.—F. Webber, Luckwell Bridge, Dunster.
Highly Commended.—J. A. Fry, Exford; H. Down, Exford; W. Steer, Exford; and J. Thorne, Bury, Dulverton.

December 10, at Yatton:—

NAG HORSE SHOEING.

1st prize.—R. Thorne, Weston-super-Mare.
2nd prize.—H. Garland, Worle, Weston-super-Mare.
Reserved.—W. C. Webber, North End, Yatton.
Commended.—J. Thomas, Banwell; F. Samson, Claverham, Yatton; and J. Horler, Sulligate Bottom, Bristol.

CART HORSE SHOEING.

1st prize.—A. Farley, Winscombe, Dulverton.
2nd prize.—W. Lane, Wrington, Bristol.
Reserved.—W. W. Amesbury, Puxton.
Commended.—F. Edwards, Weston-super-Mare; W. G. Excell, Congresbury; and A. Self, Claverham, Yatton.

At the Shoeing Competitions, held in connection with the annual Show of the Somerset Agricultural Association in May last, the Champion Gold Medal, both the first prizes, one second, and one third prize, were won by competitors who had been pupils of the School, whilst eight other pupils received commendations.

II.—*Observations on Cheddar Cheese-Making. Report for* 1897.

By F. J. Lloyd, F.C.S.

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HE Cheese School was held in 1897, at Fenswood Farm, ong Ashton, about four and a half miles from Bristol. The rm is the property of Sir Greville Smythe, Bart., and is in e occupation of Mr. Richmond Harding. The name of arding is so intimately associated with Cheddar Cheese-aking, that it might be supposed cheese had been made on is farm up to the time of the School being there; but, as a atter of fact, cheese had not been made there for many ars. The milk produced had been sent into Bristol. Hence, e system of farming had been regulated so as to produce constant supply of milk throughout the year, and the cows stead of all calving in the spring, as is the usual custom in merset, were timed to calve consecutively during the year round. Now I have invariably noticed that when cheese-making is rted on a farm where milk selling has formerly been carried , there is considerable difficulty in making good cheese, cause the milk is never collected in so cleanly a manner as should be. To this drawback had to be added another, mely, that when cheese-making was carried on upon this m many years before, difficulties of a peculiar nature were et with, which had created an impression that the neighbour-od was not well suited for cheese-making. The cheese was said be liable to rapid ripening and to an excess of acidity. As ose who have read my former Reports will understand, the fact the cheese showing an excess of acidity, would account for its pid ripening. But these were not the only troubles which had be contended with at Fenswood Farm. The cows, instead being milked in the fields as is usual in Somerset, were milked in the stalls. If it is difficult to obtain the milk fai pure when the cows are milked in the fields, it is far m difficult to do so when they are milked in a stall or shed, unl the shed be kept scrupulously clean. It is therefore not to wondered at, that with all these difficulties, the cheese was of that high quality produced at previous Schools. As I h subsequently shown in this Report, the difficulties were actua greater than would appear from the above statement of fa Certain bacteria, which have a most injurious action upon cheese, were present in the milk during the greater portion the season, though whence they came I have as yet b unable to discover.

Unfortunately the presence of these taints prevented from making many experimental cheeses, which was much be regretted, as the dairy itself and the accommodation for chemical and bacteriological work were admirably suited to t carrying out of such experiments.

I. CONDITIONS UNDER WHICH THE CHEESES WERE MADE.

(a.) THE FARM AND DAIRY.

Fenswood Farm, or that part of it which was used for feedi the dairy cows, consists of about 150 acres. The soil is sandy loam, partly upon the mountain limestone, partly on sandstone formation, and some of the fields are on the blue Li Grass on the blue Lias has generally more or less of a scouri nature, but Mr. Harding was of opinion that this herbage did scour. However, it must be noted that some of the taints n with in the curd when the cows were upon this land, wh formed only a part of the farm, were such as I have previou found present in the milk when cows were upon scouring la

The herbage was heavy and of good quality, containing clov and an abundance of hop-trefoil. But during a portion of season it was necessary to supply artificial foods in addition the grass, and in that case a mixture of two-thirds cotton one-third linseed cake was used with mangolds and hay.

The dairy was large and well ventilated, and only two fa could be found with it. One was, that it contained the w lead, which, in my opinion, ought not to be in the da especially if the milk has any taint. This taint is cert to be present in the whey, frequently to a greater extent t it was in the milk, and though it is difficult to understand h the bacteria which cause the taint can get into the atmosph yet I am forced to think that such must be the case. Thus a pigsty, as has been proved by me in the past, the atmosph laden with bacteria derived from the moist filth. Last year e opening of a cesspool enabled me to test the atmosphere ove it with the result that certain characteristic bacteria ere found in this atmosphere which were also found in the ilk during the same period. Hence the necessity of having he dairy as far as possible from any source of a foul atmosphere. he only other fault which could be found with the dairy at enswood Farm, was its proximity to the pigsties, cattle-sheds, nd a privy or earth-closet.

(*b*.) THE STOCK AND YIELD OF MILK.

The cattle were Shorthorns, mostly bred on the farm, and were by a bull which was considered to have come from a good milking strain.

The Yield of Milk.—No record of the milk yield had been kept before the Cheese School commenced, but it was roughly estimated at about 2 gallons per head per day. Judging from the results obtained in 1897, this estimate is probably not far from correct; but I do not consider it very satisfactory for a well-bred and well-fed herd. Taking the average of the seven months it is only 2·21 gallons per day, while at Mark the yield was 2·39 gallons per day, and at Haselbury and Cossington 2·18 and 2·16 gallons respectively. A record of the yield of each cow should be kept, and the poor milkers carefully weeded out. This would probably greatly augment the average yield and well repay the little trouble involved.

The Quality of the Milk.—This has been throughout the season inferior from a cheese-maker's point of view, owing to the deficiency of casein and consequent small return of curd. Only in the months of September and October was as much as 1 lb. of curd obtained from a gallon of milk, whereas in former years the yield of curd has been well over 1 lb. to the gallon of milk during at least six out of the seven months. The average composition of the milk is shown in the following table (page 148). It is not possible to compare these figures quite closely with those of former years, because, as already stated, newly calved cows were brought into the herd from time to time, while in former years all the cows had calved in the spring of the year. So poor in solids other than fat was the milk found to be on the days on which the usual observations were made in April, that during the months of May, June, July, and August it was deemed necessary to analyse the milk daily. It is the average results of these daily tests which are recorded in the following table. In the subsequent table on page 152 the results of the milk analyses on those days only on which the full record of observations was

AVERAGE COMPOSITION OF MILK for each MONTH during the YEARS 1891–97.

Month.	Year.	Locality.	Total Solids.	Fat.	Casein.
			per cent.	per cent.	per cent
April	1892	Axbridge	11·75	3·06	2·35
	1893	Butleigh	11·89	3·09	2·43
	1894	Mark	12·31	3·29	2·42
	1895	Haselbury*	12·65	3·70	2·43
	1896	Cossington	12·75	3·83	2·43
	1897	Ashton	12·74	3·87	2·45
May	1892	Axbridge	12·04	3·12	2·55
	1893	Butleigh	12·01	3·05	2·59
	1894	Mark	12·51	3·35	2·73
	1895	Haselbury*	12·58	3·39	2·60
	1896	Cossington	12·78	3·70	2·64
	1897	Ashton	12·42	3·53	2·48
June	1892	Axbridge	12·20	3·17	2·65
	1893	Butleigh†	12·03	3·08	2·65
	1894	Mark	12·52	3·40	2·69
	1895	Haselbury*	12·56	3·51	2·58
	1896	Cossington	12·50	3·57	2·64
	1897	Ashton	12·28	3·42	2·43
July	1892	Axbridge	12·20	3·21	2·66
	1893	Butleigh†	12·14	3·20	2·49
	1894	Mark	12·52	3·47	2·64
	1895	Haselbury*	12·68	3·60	2·67
	1896	Cossington	12·61	3·66	2·58
	1897	Ashton	12·20	3·39	2·35
August	1891	Vallis	12·61	3·87	2·76
	1892	Axbridge	12·78	3·38	2·65
	1893	Butleigh†	12·14	3·19	2·77
	1894	Mark	12·78	3·70	2·76
	1895	Haselbury†	12·82	3·80	2·68
	1896	Cossington	12·73	3·83	2·66
	1897	Ashton	12·45	3·63	2·38
September	1891	Vallis	13·00	4·13	2·99
	1892	Axbridge	12·56	3·57	2·87
	1893	Butleigh†	12·53	3·53	2·95
	1894	Mark	13·05	3·93	2·83
	1895	Haselbury*	13·03	3·94	2·91
	1896	Cossington	13·19	4·31	2·71
	1897	Ashton	12·89	3·86	2·59
October	1891	Vallis	13·81	4·75	3·21
	1892	Axbridge	13·13	4·00	3·08
	1893	Butleigh†	13·49	4·30	3·14
	1894	Mark	13·46	4·39	2·95
	1895	Haselbury*	13·70	4·55	2·92
	1896	Cossington	13·38	4·41	2·85
	1897	Ashton	13·22	4·18	2·71

* For first and third weeks in month. † For first week in month only.

are given, but these analyses, as they represent the com-
ion of the milk on only four or five days per month, cannot
mpared with the preceding average results.

(c.) COMPARISON OF RESULTS OBTAINED, 1891–97.

he following tables give an epitome of the results which
been obtained during the past seven years :—

AVERAGE RESULTS OBTAINED, 1891–97.

MONTH.	VALLIS, 1891.				
	Vol. of Milk.	Cheese taken from Press.	Cheese when sold.	Shrinkage in ripening.	Cheese from one gallon of Milk.
	galls.	lbs.	lbs.	lbs.	lbs.
l	81	73	69	4	·85
	119	117	111	6	·93
	132	132	123	9	·93
	112	114	107	7	·96
st	91	99	91	8	1·00
mber	79	87½	82	5½	1·04
ber	52	64	59½	4½	1·14

MONTH.	AXBRIDGE, 1892.				
	Vol. of Milk.	Cheese taken from Press.	Cheese when sold.	Shrinkage in ripening.	Cheese from one gallon of Milk.
	galls.	lbs.	lbs.	lbs.	lbs.
l	79	70	66	4	·83
	109	102	94	8	·86
	127	122	113	9	·90
	116	115	108	7	·93
st	100	102½	94	8½	·94
mber	84	91	85	6	1·01
er	58	68	62	6	1·07

MONTH.	BUTLEIGH, 1893.				
	Vol. of Milk.	Cheese taken from Press.	Cheese when sold.	Shrinkage in ripening.	Cheese from one gallon of Milk.
	galls.	lbs.	lbs.	lbs.	lbs.
l	106	96	89	7	·84
	149	142	132	10	·88
	141	130	121½	8½	·85
	134	129	122	7	·91
st	134	131½	124	7½	·92
mber	102½	109½	104	5½	1·02
er	68	80	77	3	1·13

AVERAGE RESULTS OBTAINED, 1891–97.

MONTH.	MARK, 1894.						
	Vol. of Milk.	Cheese taken from Press.	Cheese when sold.	Shrinkage in ripening.	Cheese from one gallon of Milk.	Average No. of Cows.	Average yield of Milk per head per day.
	galls.	lbs.	lbs.	lbs.	lbs.		galls.
April	103	101	96	5	·93	33	3·12
May	148	148	140	8	·94	50	2·96
June	140	141	132	9	·94	51	2·74
July	129	131	124	7	·96	52	2·48
August	112	118	112	6	1·00	52	2·15
September	100	112	106	6	1·06	53	1·89
October..	74	87	81	6	1·09	53	1·40

MONTH.	HASELBURY, 1895.						
	Vol. of Milk.	Cheese taken from Press.	Cheese when sold.	Shrinkage in ripening.*	Cheese from one gallon of Milk.	Average No. of Cows.	Average yield of Milk per head per day.
	galls.	lbs.	lbs.	lbs.	lbs.		galls.
April	126	126	118	8	·94	46	2·74
May	175	167	159	8	·91	61	2·87
June	183	168	159	9	·87	70	2·61
July	146	148	138	10	·95	70	2·09
August	139	152	138	14	·99	70	1·99
September	113	124	119	5	1·05	69	1·64
October..	76	90	87	3	1·14	65	1·17

MONTH.	COSSINGTON, 1896.						
	Vol. of Milk.	Curd, taken from Press.	Cheese when sold.	Shrinkage in ripening.	Cheese from one gallon of Milk.	Average No. of Cows.	Average yield of Milk per head per day.
	galls.	lbs.	lbs.	lbs.	lbs.		galls.
April	163	136	130	6	·80	51	3·19
May	166	164	157	7	·94	56	2·96
June	153	152	142	10	·93	59	2·60
July	137	139	131	8	·96	60	2·28
August	107	114	110	4	1·03	60	1·78
September	77	86	80	6	1·04	60	1·28
October..	56	66	61½	4½	1·10	50	1·12

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* This was excessive in April, July, and August, partly owing to the heat of the season, partly to the cheese not being sold so soon as in former years.

AVERAGE RESULTS OBTAINED, 1891–97.

MONTH.	ASHTON, 1897.						
	Vol. of Milk.	Curd taken from Press.	Cheese when sold.	Shrinkage in ripening.	Cheese from one gallon of Milk.	Average No. of Cows.	Average yield of Milk per head per day.
	galls.	lbs.	lbs.	lbs.	lbs.		galls.
. .. .	92	90	85	5	·92	36	2·55
. .. .	130	124	114	10	·88	45	2·88
. .. .	130	123	113	10	·87	48	2·70
. .. .	102	95	87	8	·85	49	2·08
. .. .	90	85	78	7	·87	49	1·83
er	88	89	83	6	·94	50	1·76
. .. .	79	81	77	4	·97	47	1·68

II.—THE RECORD OF OBSERVATIONS.

order to obtain some knowledge of the conditions under the cheeses were being made, it was deemed desirable, ι week, to record fully all the sixty observations, details of have been given in my former Reports. The following (page 152) give the average results of these weekly obser- ıs and of the analyses made on the same days as the ʼations.

ıt year and again in this Report I have stated the acidity milk to three places of decimals. Those who are using cidity apparatus have only been accustomed to use two of decimals, and enquiries were made as to the meaning third decimal. To the cheese-maker they have no especial , and the two places of decimals are quite sufficiently ıte as a guide in actual practice. My object in estimating ɔidity more minutely than can be done with the ordinary on was to determine slight differences between the milk, , &c., which might perhaps help me in my research work.

ɜre is one point of importance in the above table to which ıecessary to draw attention.

will be noticed that the acidity of the liquid from press, ın 53, was, during the months of August, September, and ɪer, much lower than the acidity of the liquid from curd grinding. This is due to the prevalence during these hs of the fæcal taint. When this is present it is always sary to develop in the curd before grinding a larger per- ge of acid than is actually required in the liquid from press.

(*a*.) COMPARISON WITH FORMER YEARS.

ɘ most striking feature about these results is the exception- ow acidity of the milk, both in the evening and in the ing. During the six preceding years of observation the

D OF OBSERVATIONS, LONG ASHTON, 1897.

							10	11	13	14	15	20	23	25	27	34	35		51	53	54	55	60
	ING'S MILK.								MORNING'S MILK.			MIXED MILK.											
		At night.			In morning.																		
	Volume of Milk.	Temp. of Dairy.	Temp. of Milk.	Acidity.	Temp. of Dairy.		Temp. of Milk.	Acidity.	Volume.	Acidity.	Total Volume of Milk.	Acidity.	Proportion of Rennet added.	Acidity of Whey before breaking.	Acidity of Whey put aside.	Acidity of Whey when drawn.	Acidity of drainings from piled Curd.	Acidity of drainings from Curd before grinding.	Weight of Curd when vatted.	Acidity of Liquid from Press.	Weight of Curd taken to Cheese Room.	Loss in Press.	Weight of Cheese when sold.
	galls.	° F.	° F.	Per cent.	° F. min.	° F. max.	° F.	Per cent.	galls.	Per cent.	galls.	Per cent.	1 of Rennet to	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	lbs.	Per cent.	lbs.	lbs.	lbs.
	39	63	87	·198	62	67	73	·207	46	·198	85	·213	8000	·140	·152	·183	·27	·93	89	1·08	84	5	78
	59	63	88	·185	60	63	73	·189	70	·184	129	·187	7185	·122	·132	·164	·24	·92	132	·98	123	9	112
un-	62	66	89	·170	65	67	71	·178	69	·168	131	·175	6005	·121	·150	·173	·26	·92	133	·98	124	9	113
ul	51	68	87	·146	66	68	71	·157	52	·144	103	·156	6005	·106	·110	·169	·28	·92	104	·93	98	6	90
Augus	47	68	89	·149	66	70	74	·154	44	·149	91	·158	5993	·105	·100	·164	·26	·91	91	·89	85	6	77
Septem	38	65	89	·162	62	65	74	·171	51	·159	89	·169	6003	·110	·122	·178	·27	·93	94	·83	90	4	84
October	34	62	87	·167	60	62	71	·176	48	·164	82	·172	6004	·116	·125	·197	·28	·93	90	·81	87	3	82

MONTHLY AVERAGES OF RESULTS OF ANALYSES, LONG ASHTON, 1897.

MONTH.	COMPOSITION OF MIXED MILK.							COMPOSITION OF WHEY.			COMPOSITION OF CURD.			
	Water.	Solids.	Fat.	Casein.	Albumin.	Sugar.	Ash.	Solids.	Fat.	Ash.	Water.	Solids.	Fat.	Ash.
April . . .	87·26	12·74	3·87	2·45	·42	5·29	·71	7·23	·42	·46	42·01	57·99	30·00	2·08
May . . .	87·45	12·55	3·65	2·48	·38	5·33	·71	7·19	·44	·43	41·95	58·05	28·57	2·25
June . . .	87·63	12·37	3·50	2·43	·38	5·35	·71	7·08	·45	·52	42·58	57·42	28·12	2·26
July . . .	87·54	12·46	3·61	2·35	·37	5·41	·72	7·02	·51	·54	41·40	58·60	30·58	2·17
August . .	87·46	12·54	3·66	2·38	·35	5·42	·73	7·05	·53	·51	41·42	58·58	30·57	2·17
September .	87·11	12·89	3·86	2·59	·38	5·34	·72	7·08	·43	·54	41·90	58·10	29·39	2·12
October . .	86·78	13·22	4·18	2·71	·44	5·14	·75	7·13	·44	·51	41·30	58·70	29·41	2·10

acidity of the milk has never been so low. It is interesting to note that the percentage of casein in the milk has also been lower than at any other Cheese School during the six years. Whether there is any relation between the two it is not possible for me to say. *Primâ facie*, as the acidity of the milk depends largely upon the acid mineral salts it contains, and as the mineral matter in the milk at Long Ashton was high, one would have expected a high acidity in the milk. Moreover, as the casein combines with some of the mineral matter, and as the casein is low, one would again expect a higher proportion of free mineral matter. It may be that, as the casein combines mainly with lime, and as there was not much casein present, less lime was utilised in this way than usual, and so the excess neutralised the natural acidity of the other constituents. Having already drawn attention to the small percentage of casein, it may be as well to here refer to another effect thereof.

(*b*.) Loss of Fat in the Whey.

The large proportion of fat in the whey is, I think, accounted for by this want of casein. Whenever the proportion of casein has been small there has been a loss of fat from the curd. Sometimes this loss is in the liquid from the press; but in 1897 it was mainly in the whey, and very little was lost in the liquid from press. Why was this? The acidity developed with a fair degree of rapidity, so that the acidity of the whey when drawn, although low as compared with the acidity of the whey in former years, was high as compared with the original acidity of the milk. Hence, contraction of the curd would have taken place while in the whey, and so the fat it was unable to retain would have been expelled, whereas had the whey been drawn before this contraction had taken place, the fat would have been expelled subsequently when the curd was submitted to pressure.

Another result of this development of acidity in the whey was, that the acidity developed with rapidity in the subsequent stages, so that the 1·00 of acid which is desired in the liquid from press was easily obtained without any undue delay in the cheese-making. In fact, the cheese was finished on an average thirty to sixty minutes earlier than it had been in former years.

This is a striking confirmation of the conclusion which I came to some years ago, that in order to make the cheese rapidly it is necessary to have at least as much acidity in the whey, when drawn, as was present in the original milk. It also shows that it is not desirable to fix a standard for the acidity in the whey irrespective of the original acidity of the milk.

(*c.*) THE ACIDITY OF CURD.

In my Report for 1896 I drew attention to the acidity of the curd, and stated that it would receive further attention. During 1897 this subject has been studied, and the acidity of the curd frequently estimated by at least two methods. In addition, many experiments have been made, and it will now be my endeavour to summarise the results and state the lessons which may be learnt from them.

The quantity of acid which appears to be present in the curd depends very largely upon the method adopted for its estimation. These methods were described in the Report for 1896.

The results depend primarily upon the quantity of water with which the curd is diluted before estimating the acidity by any process. This is seen in the following experiments. Two grammes of curd were finely minced and 25 c.c.* water added, the acidity indicated was ·75 per cent.; 2 grammes of the same finely minced curd treated with 100 c.c. water showed only ·65 per cent. acidity.

A similar result is obtained if the curd is ground into a paste with water before the estimation of acidity. Thus 2 grammes of curd were ground up in a mortar with 50 c.c. water, and showed an acidity of 1·00 per cent., while 2 grammes of this curd when ground up with 100 c.c. water showed only ·85 per cent. of acidity. Numerous experiments have been made upon this point, quantities of water varying from 25 c.c. to 150 c.c. being used, and always with the same results.

I can only account for these variations by assuming that the alkaline solution of soda with which the estimation is made acts upon the casein itself when in a finely divided state, and that this action diminishes with the increasing dilution of the solution. In order that there should be no doubt about this, three experiments were made with the same curd, 2 grammes being taken in each case. One portion was ground as finely as possible, the second not quite so finely, and the third roughly. The acidities obtained were 1·35 per cent., 1·15 per cent., and 1·00 per cent. respectively, which prove that the action of the soda depends on the fineness of the curd. Similar fluctuations were found when estimating the "casein acidity" by treatment with soda, as described in the 1896 Report, the results varying with the quantity of soda taken, as also with the temperature to which the solution was heated. Some experiments were also made to test the effect upon the estimation of using indicators other than phenolphthalein. The results were rather remarkable.

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* C.c. or cubic centimetres (French measure); one ounce contains about 30 c.c.

With methyl-orange as indicator, the curd instead of showing an acid reaction, now showed an alkaline. It was very evident, in face of these results, that if the determination of the acidity of the curd had to be made, or was likely to throw any light upon the problems of cheese-making, the acidities must be estimated daily in the same way.

The following methods were therefore fixed upon in order to obtain uniform results, but not as being more accurate than any other methods. For the estimation of the acidity soluble in water, 2 grammes of curd were taken, rubbed up in a mortar with a small quantity of water, and made up to 30 c.c. For the estimation of casein acidity, 2 grammes were taken, minced very fine, transferred to a large test tube with 15 c.c. soda solution, each c.c. of which would neutralise 0·01 lactic acid, boiled, and the excess of unneutralised soda estimated; that which had been neutralised represented the "casein acidity."

All the figures given in the following tables were obtained in this way, and represent the acidities in terms of lactic acid (percentages).

Acidity of the Curd at different stages in the manufacture of the Cheeses.—This has been estimated on three occasions, and the results are given in the following table.

Acidities of Curd at Different Stages.—Percentage, as Lactic Acid.

Stage in Manufacture.	Curd of May 13, 1897.			Curd of July 20, 1897.			Curd of Sept. 22, 1897.		
	In liquid draining from Curd.	In Curd soluble in water.	In Curd when treated with Soda (Casein acidity).	In liquid draining from Curd.	In Curd soluble in water.	In Curd when treated with Soda (Casein acidity).	In liquid draining from Curd.	In Curd soluble in water.	In Curd when treated with Soda (Casein acidity).
After taking to cooler	·39	..	..	·51	..	..	·38	..	..
„ 1st cutting ..	·58	·75	3·60	·69	·75	3·40	·53	·75	3·40
„ 2nd „ ..	·78	1·10	3·70	·85	·90	3·50	·77	·90	3·35
„ 1st turning ..	·93	1·25	3·70	·96	1·15	3·50	·86	1·00	3·50
„ 2nd „ ..	1·04	1·40	3·75	..	..	..	·98	1·05	3·45
„ grinding.. ..	1·02	1·40	3·80	1·02	1·35	3·70	·90	·90	3·45

A careful study of these figures shows that both the acidity of the liquid draining from the curd, and the water soluble acidity of the curd itself, increase rapidly during the manufacture of the cheese, but that there is no corresponding increase in the "casein acidity."

The acidity soluble in water is due mainly to the lactic acid present in the curd. The casein acidity is remarkable for its constancy. One would expect it to rise simultaneously with the rise in acidity of the liquid from curd. As it does not, there would seem to be an actual decrease in the true acidity of the curd.

But there can be little doubt as to the practical lesson to be learnt from these figures, namely, that the acidity of the curd affords no indication of the progress in manufacture, while the acidity of the liquid draining from the curd undoubtedly affords a very distinct guide to the condition of the curd itself.

Acidity of Curd when ground.—This has been estimated 103 times during the season, both as regards solubility in water and solubility in soda. It is not necessary to quote these voluminous figures. For my purpose it will be sufficient to give merely average results. The object of taking these averages has been to determine whether, when taking a large number of determinations into account and so eliminating exceptional results, any relation could be found between the acidity of the curd and the acidity of the liquid from the press.

The following table gives the results obtained:—

AVERAGE ACIDITY OF CURD WHEN GROUND.

——	Average Acidity of liquid from Press.	Acidity of Curd in Water.	Acidity of Curd in Soda (Casein acidity).
Of 8 samples where the liquid from press contained under ·80 per cent. acid	0·75	0·95	3·47
Of 28 samples where the liquid from press contained under ·90 per cent. acid	0·85	1·05	3·57
Of 38 samples where the liquid from press contained under 1·00 per cent. acid ..	0·94	1·17	3·68
Of 29 samples where the liquid from press contained over 1·00 per cent. acid	1·04	1·38	3·80

Little had I expected that the results of this seven months' work would prove so interesting and conclusive as they do when arranged as in the above table. It is evident that the acidity of the curd, soluble either in water or in soda, rises on an average in the same proportion as the acidity of the liquid from press; indeed, we may say is dependent upon the acidity of the liquid which permeates the curd.

It would even appear that the acidity of the casein proper is almost unaltered. For if we deduct from the acidity of the curd in soda the acidity of the liquid from press, we obtain as the true acidity of the casein the following figures, 2·72, 2·72, 2·74, 2·76, which are remarkably similar. These figures indicate that for the practical cheese-maker the acidity of the liquid from the press is an amply sufficient guide to the acidity of the curd when it is placed in the cheese-room.

The last point of importance was whether the acidity of the curd would influence the ripe cheese. It has only been possible to make a few experiments upon this subject, the results of which are tabulated below.

DATE.	Acidity of Liquid from Press.	Acidity of Curd in Water.	Acidity of Curd in Soda.	Acidity of ripe Cheese in Water.
	Per cent.	Per cent.	Per cent.	Per cent.
April 13	..	1·90	5·05	2·65
„ 21	1·00	1·60	4·60	2·35
„ 27	·99	1·85	3·80	2·30
May 5	·95	1·00	3·60	2·80
„ 7	·97	1·40	3·95	2·85
„ 12	·90	1·20	3·80	2·75
„ 21	1·07	1·35	3·80	3·00
June 8	1·03	1·25	4·00	3·10
„ 24	·84	1·35	3·75	2·90
„ 26	1·09	1·35	3·80	3·00
July 1	1·02	1·25	3·65	2·68
„ 14	·90	1·20	3·65	2·80
„ 24	·93	1·10	3·65	2·68
Aug. 10	1·00	1·20	3·55	2·16
„ 17	·91	1·20	3·70	2·34
Sept. 8	·79	·90	3·40	2·16
„ 14	·81	·90	3·70	2·16
„ 22	·90	·90	3·45	2·16
„ 23	·86	·90	3·45	2·34
„ 28	·85	·90	3·55	2·34
Oct. 12	·81	·85	3·45	2·34
„ 19	·89	·95	3·50	1·98

These results indicate that the acidity of the ripe cheese, as estimated by treatment with water, follows very closely the acidity of the liquid from press.

It is evident that both as regards "casein acidities" in the curd, and the acidity of the ripe cheese, there are now and again exceptions to the rule which has been indicated above from the study of averages. These exceptions are, I find, sometimes due to the presence of a particular taint in the curd which invariably causes the liquid from press to show less acidity than was present in the liquid coming from the curd before grinding. Probably other variations are largely due to the proportion of liquid (whey) and of pure casein, present in the curd when ground, not being constant.

Summarising the results of these investigations into the acidity of curd, I am inclined to think that the estimation of the acidity in the liquid draining from the curd is accurate guide to the acidity of that curd, and will enable the cheese-maker to judge with certainty when the curd is fit to grind; moreover, that the estimation of the acidity of the liquid from the press affords a sufficient guide for all practical purposes, as to both the quality and keeping power of a cheese.

(*d.*) THE LIME IN MILK, CURD, &C.

Some years ago I came to the conclusion that the principal mineral constituent in milk which played an important part in the manufacture of a cheese was the lime. Some work in connection with this subject done in 1897 may here be referred to. In the following table will be found the total quantity of

TABLE I.—LIME IN MILK, AND ALL THE PRODUCTS THEREFROM.

Substance on—	Weight.	Percentage of Lime (CaO).	Weight of Lime (CaO).
7/5/97.	lbs.		lbs.
Milk	1249	·224	2·79
Whey	1110	·095	1·054
Curd	122	1·176	1·435
Drainings after taking to cooler ..	10½	·235	·025
,, ,, 1st cutting	2½	·364	·009
,, ,, 2nd ,, ...	2	·481	·009
,, ,, 1st turning	1	·594	·006
,, ,, 2nd ,, ...	1	·650	·006
	..	..	2·544
20/7/97.			
Milk	1000	·2128	2·128
Whey	895	·101	·904
Curd	95	1·064	1·011
Drainings after taking to cooler ..	6½	·325	·021
,, ,, 1st cutting	1½	·392	·006
,, ,, 2nd ,, ...	1	·537	·005
,, ,, 1st turning	1	·605	·006
	..	..	1·953
22/9/97.			
Milk	898	·224	2·011
Whey	792	·129	1·021
Curd	94	1·064	1·000
Drainings after taking to cooler ..	7	·215	·015
,, ,, 1st cutting	1½	·308	·004
,, ,, 2nd ,, ...	1½	·408	·006
,, ,, 1st turning	1	·526	·005
,, ,, 2nd ,, ...	1	·604	·006
	..	..	2·057

ɜ present in the milk on the 7th May, 20th July, and 28th tember respectively. How this lime was subsequently dis- ›uted over the various products of the cheese is also shown. vill be noticed that about one-half of the lime in the milk ıains in the curd, the remainder being lost in the whey, and er liquids draining from the curd. The lime in the curd ı been estimated on twenty-nine occasions, and the results ›w that the curd contains on an average 1·08 per cent. of ıe (CaO).

Γhe second fact illustrated by this table is that as the acidity the liquid draining from the curd increases, from the whey ward, the percentage of lime present in the liquid also ːreases, proving that the increasing acidity is drawing this ıe away from the curd. This view is supported by com- ɾing the percentage of lime in the curd with the acidity of ɜ liquid from press. Taking into account a number of amples, it is found that the higher the percentage of lactic ıd developed in the curd, the smaller the proportion of lime ıich is left in that curd. These results, however, are com- .cated by the fact that the percentage of lime originally esent in the milk is not a constant factor. It would thus pear that the lime is in some way connected with the curd, chemists say, "combined" with it.

On one occasion the total mineral matter in the milk and all e products therefrom was estimated, and the results obtained ɜ given in the following table:—

ΓABLE II.—MINERAL MATTER IN MILK, AND ALL ITS PRODUCTS.

Substance on—	Weight.	Percentage of Ash.	Weight of Mineral Matter.
22/9/97.	lbs.		lbs.
lk	898	·68	6·106
hey	792·0	·56	4·435
liquid from Curd	—	—	—
ter taking to cooler	7·0	·80	·056
„ 1st cutting	1·5	·98	·014
„ 2nd „	1·5	1·24	·018
„ 1st turning	1·0	1·42	·014
„ 2nd „	1·0	1·58	·015
Curd	94·0	2·00	1·880
	898·0	..	6·432

It is apparent that the total mineral matter found in all the ːoducts is greater than that present in the milk. The ex- .anation of these figures is difficult to find. The errors of ıalysis would scarcely account for so great a difference betw the total mineral matter found in the milk and that found in the curd, whey, and liquids. Several conjectural explanations occur to me, which, however, it is useless to mention until further investigation has given some support to them, and I quote the results merely as indicating that there is yet matter needing further inquiry before we shall understand all the intricacies of cheese-making.

(*e.*) THE COMPOSITION OF THE CHEESES.

A few samples of the cheeses when ripe were taken for analysis, and the results are given in the following table. The most characteristic point about these cheeses is that they contain far more moisture (water) than the average of former years. This is probably due to the deficiency of casein, and consequent diminished contractile power of the curd. It also helps to explain the rapid ripening of the cheeses. For the greater the quantity of whey left in the curd the greater the amount of food for the bacteria to feed upon, and consequently the more rapid the growth of these bacteria.

ANALYSES OF CHEESE.

Made.	Sampled.	Water.	Fat.	Casein, &c.	Ash.
April 5	6/7/97	38·10	31·36	26·34	4·20
„ 13	„	36·20	32·48	27·32	4·00
„ 21	„	35·90	33·82	25·88	4·40
„ 27	„	37·20	30·68	27·62	4·50
May 5	4/10/97	36·80	31·05	28·45	4·70
„ 7	„	35·70	31·08	28·82	4·40
„ 12	„	36·80	29·96	28·94	4·30
„ 21	„	36·80	31·11	27·69	4·40
June 8	„	37·10	30·37	28·33	4·20
„ 24	„	38·50	29·52	27·18	4·80
„ 26	„	36·40	31·92	27·38	4·30
July 1	18/11/97	36·75	33·12	26·18	3·95
„ 14	„	38·60	31·40	25·50	4·50
„ 24	„	36·05	32·00	27·85	4·10
Aug. 1	„	36·30	32·56	26·79	4·35
„ 10	20/12/97	34·95	31·20	29·75	4·20
„ 17	„	32·55	33·60	30·15	3·70
Sept. 8	„	36·70	30·08	29·32	3·90
„ 14	„	37·45	28·67	29·93	3·95
„ 22	„	35·65	31·20	29·45	3·70
„ 23	„	35·15	31·62	29·58	3·65
„ 28	„	32·10	31·36	33·54	4·00
Oct. 12	„	38·15	30·80	27·10	3·95
„ 15	„	36·80	31·20	28·00	4·00
„ 19	„	36·65	31·44	28·01	3·90

(*f*.) THE RIPENING OF CURD.

ı the object of continuing the investigation into the g of Cheddar Cheese which had been commenced in 1896, le of the cheese made at Long Ashton on April 24th, vas submitted to analysis. On the 14th of June it showed signs of being nearly ripe, though not two had elapsed since it was made. The results of these s are given in the following table:—

—	CHEESE OF APRIL 24, 1897.	CHEDDAR CHEESE OF SEPT. 7, 1896.		
	On June 14, 1897.	On Sept. 16, 1896.	On Jan. 25, 1897.	On Nov. 18, 1897.
r	38·55	37·75	34·65	27·60
s	61·45	62·25	65·35	72·40
ntaining :—				
Fat	25·84	33·16	34·54	37·40
a) Casein, &c., by difference	31·61	25·14	26·76	30·15
b) Mineral matter	4·00	3·95	4·05	4·85
ı) Casein by estimation of × 6¼	28·68	23·56	25·11	33·93
acidity calculated as Lactic id	2·97	1·53	2·07	2·70
) Lime	·84	..	1·04	·90
ıle constituents—				
tal solids	10·80	8·80	13·60	20·10
idity calculated as Lactic Acid	1·62	·81	·85	2·16
neral matter	3·80	..	3·40	4·30
Containing Lime	·56	..	·89	..
sein, by estimation of N × 6¼	..	4·00	9·30	9·59
ımonia Volatile	..	0·09	..	..
utralising power estimated s Ammonia	·34	·30	·34	·37
latile acids estimated as Butyric Acid	..	..	..	1·20

ill be seen that there has been a rapid development of , and nearly 11 per cent. of the curd has become soluble in This result greatly surprised me and led to the enquiries subsequently resulted in my discovering that Fenswood ıad been noted for making quickly ripening cheese. I ed the result of my analysis to Miss Cannon, and subtly to Mr. Gibbons. In spite of this fact the cheeses ot considered to be ripening quickly, and were kept in the cheese-room for even longer than usual before being sold. The result was that ripeness proceeded too far, and the cheese deteriorated.

This result was confirmed on the 20th December. I then carefully tasted the cheeses of August, September, and October, and was surprised to find that the October cheeses were in excellent ripe condition and of good flavour. The September cheeses were, in my opinion, very ripe and not of such good flavour, and the August cheeses had gone off considerably.

What explanation can be given of these facts? When in the middle of the season, Miss Cannon found that the cheeses were ripening two rapidly, she carefully diminished the acidity of the curd, as may be seen from the acidity of the liquid from press in the record of observations on page 152. Even in spite of this precaution the cheeses still showed a tendency to rapid ripening. I am of opinion that this was due partly to the nature of the taints present in the curd.

But there is another problem which needs most careful consideration in respect to this peculiarity. It has been previously stated that the acidity of the milk at Long Ashton was exceptionally low. Is it then desirable, when dealing with milk of this nature, to obtain so much acidity in the curd before grinding, as is necessary when dealing with milk which possesses a higher acidity?

It will be remembered that the curd was found sufficiently tough to enable the whey to be drawn long before that whey had attained an acidity which would have been considered necessary on most farms, and it would also seem that in estimating the time for grinding the curd, it was not necessary to wait for the development of as much acidity as had been found necessary in former years.

It would appear that a standard of acidity for the liquid from curd before grinding, and from the press, must vary according to the acidity of the original milk, and that instead of obtaining a definite amount of acidity in these liquids it may be necessary only to obtain a definite increase of acidity on the original acidity of the milk. Strong as the evidence appears to be in support of this theory, I do not think it would be [illegible] more than suggest it as worthy of future consideration. It would be wrong to dogmatise from the result of [illegible] observation. However, those cheese-makers who are using the acidity apparatus as a guide in their cheese-making would do well to bear this in mind, and should try and find out by careful observation to what extent it must guide their practice.

. . .

other point in connection with the ripening of cheese en investigated, namely, the effect of keeping a cheese elve months. The cheese of September 7th, 1896, was ed for the third time on November 18th, 1897, and the of the three analyses, two of which were published in ar's Report, are given in the preceding table (page 161). l be seen that the acidity of the cheese has increased, ratively speaking, but slightly. But the soluble con- its have very greatly increased, as also the soluble . Also there has been a considerable amount of butyric rmed.

n the results of these investigations, I am inclined to that the determination of the solid matter soluble in and the acidity thereof afford a very fair indication of eness of a Cheddar cheese. And so far as can be judged he results at present obtained, not more than 15 per cent. be soluble, and the soluble acidity should amount to 2·5 per cent.

III.—THE BACTERIOLOGICAL OBSERVATIONS.

se have been numerous and for the most part carried out ormer years.

(*a.*) SOME METHODS OF INVESTIGATION.

attempt was made to differentiate between various ia by cultivating them on gelatine which had been ed blue with litmus. They were also grown in milk with litmus. The sub-cultures on gelatine containing did not grow so well as those on ordinary gelatine, and d discover no advantage in the use of litmus gelatine stinguishing between the various kinds of bacteria. If, er, it is desired to photograph the cultures, better photo- can in most cases be obtained when they are grown on gelatine than when grown upon the ordinary gelatine. are a few exceptions to this, for some of the cultures the blue colouring matter of the litmus and are less t than ordinarily.

cultivation of the bacteria in milk which had been y tinted blue with litmus was of far more value as a of distinguishing between different varieties. Probably ost characteristic growth is that of the Bacillus acidi The milk is first turned a bright red, and when it s is entirely bleached. By degrees the colour comes back until the whole is once more of a bright red colour. A few organisms produce an acid reaction very slowly, but it was rare to meet with an organism which by producing an alkaline substance caused the litmus to become distinctly blue.

"Shake" cultures were made of those organisms, which were thought to produce spongy curd, and so far, they have in all cases been found to produce gas copiously in the gelatine. This is an easy way of distinguishing the organisms which produce spongy curd, without the necessity of making an experimental cheese.

(*b.*) PURE CULTURES AS STARTERS.

During the first year of my observations on Cheddar cheese-making, I found that the principal bacteria in the cheese were the bacilli of lactic acid. In the succeeding year experiments were made to see how far this knowledge might be turned to account, by inoculating the milk with these organisms. But because I have not thought it desirable to report fully upon this side of my work, the opinion seems to have gained ground in Somerset that I have allowed those who are interested in the manufacture of Cheddar cheese in the North to take a distinct step in advance. But a special reason existed in Scotland for introducing the use of pure cultures. There Cheddar cheese is made with milk which has been artificially coloured. Certain organisms, introduced into the milk by dirt, cause this colouring matter to be bleached, and the cheese becomes discoloured wherever the organisms are present in numbers. By ensuring a proper degree of acidity in the curd, these organisms are to a certain extent checked in their growth and action. By the system of cheese-making adopted in Scotland no sour whey is used; and as these discolouring organisms not only grow more rapidly than the lactic acid organisms, but, to a certain extent, are inhibitory to their growth, the use of pure cultures was essential to overcome this effect of dirty milk. Fortunately, coloured cheese is not made in Somerset, so there was no urgent call for the introduction of pure cultures.

Now I have purposely refrained from introducing the use of pure cultures of bacteria into Cheddar cheese-making in Somerset for the following reasons. First:—In my opinion it would have been foolish for me to put forth, for the guidance of cheese-makers, any ideas which, when they attempted to carry them into effect, would be found wanting in practical value. I had come to the conclusion from my observations that inoculating the milk with a pure culture of the lactic acid bacillus would not insure a good cheese. Other things being equal, the greater the number of lactic acid bacilli in the milk, the greater the chance of a good curd, but I am still of opinion that this organism alone will not produce that nutty flavour which is so much sought after as being the essential characteristic of an excellent Cheddar cheese. The second consideration was that the presence of the Bacillus acidi lactici in abundance would not entirely counteract the evil influence of bacteria which produce taints. Hence I considered it to be my first duty to discover the causes of these taints, whence they arise, and how to prevent them. It may be urged that the necessity of cleanliness, which is in other words the procuring of milk free from injurious bacteria, is well known to all cheese-makers. I can only say that if known, it is not invariably practised, and that, even where it is practised, and in the dairies of the best cheese-makers, taints will arise at times, and utterly baffle the skill of even the most experienced makers. Thirdly: I had observed that when there happened to be naturally an excess of lactic acid organisms in the milk, so that acidity developed rapidly, many makers were utterly unable to cope with the conditions, and the resulting cheeses were too acid. It was very evident that the use of pure cultures of lactic acid bacteria would only augment this difficulty, and that until some accurate method of estimating the acidity during the process of cheese-making was in general vogue, the cheese-makers were not in a position to make full use of the discoveries of science. But the use of the apparatus for testing acidity, which has been one outcome of these investigations, has been growing rapidly, and it has become necessary to again turn my attention to the question, whether cheese-makers might utilise pure cultures of the Bacillus acidi lactici, and if so, how?

There are several difficulties to be contended with in the use of pure cultures. The first, which with some care can be overcome, is to carry on, from day to day, the culture of the desired organism without its becoming contaminated. The second difficulty is far greater, and, as yet, I do not see how it is to be overcome without considerable modification of the method of manufacturing Cheddar cheese, at present adopted in the West of England.

It has been pointed out in former Reports that the lactic acid organism grows comparatively slowly, whilst many of those organisms which produce taints grow rapidly. Now it is self-evident that, if we desire to use the lactic acid organism in the form of a pure culture, we must give it every advantage we can. In the present system of making Cheddar cheese, the evening's milk when brought into the dairy has a temperature of about 80°–90° Fahr., and care is taken that the temperature shall not fall below 70° Fahr. by the morning. Hence, as these temperatures are favourable to their growth, the bacteria present in the milk are rapidly growing during the whole of the night. It would, therefore, seem of little value to introduce a pure culture into the milk in the morning, as at most the bacteria could only have a slightly beneficial result under such circumstances. The employment of pure cultures has been most successful in the production of butter, because it is possible to first destroy all bacteria present in the milk as it comes into the dairy, by heating it to a temperature which is destructive to bacteria. This is termed Pasteurisation. Unfortunately, it is not possible to Pasteurise milk which is intended for cheese-making, as rennet will not coagulate Pasteurised milk. The only other method of checking the growth of bacteria is to cool the milk to a very low temperature. In the West of England, with the present form of cheese-tub, this would be found a difficult task; in Scotland, where the milk-tubs are surrounded by a water-jacket, it is less difficult, provided there is a good supply of cold water. The scarcity of cold water in many of the cheese-making districts of the West of England is so great, that even the introduction of the jacketed-vat would not materially help the cheese-maker there.

Such are the reasons why I have not attempted to move more rapidly in the use of pure cultures of bacteria. However, during 1897, many experiments were made to see how far some of these difficulties might be overcome.

The Preparation of a Pure Culture.—The way to do this in the laboratory has been described in a former Report; but it is evident that the preparation of a pure culture from day to day in the dairy cannot be carried out in glass vessels. I therefore had some tall cylindrical metal vessels prepared for the purpose. The vessels are of tin, and the lid is removable. There are two openings in the lid, the centre one intended for the stem of a metal stirrer, and the other for a thermometer, [illegible] of which are packed in cotton-wool. The stirrer consists [illegible] perforated disk of tin attached to a strong rod, which must [illegible] perfectly smooth and pass up and down in the cotton-wool [illegible]

[illegible] sterilised by passing high-pressure steam [illegible] boiler. Some newly drawn milk is next [illegible] in the can and sterilised by placing the vessel in boiling [illegible] and keeping it there for twenty to thirty minutes. To btain the best results, this stertilising must be repeated the ext day, so that if a pure culture were being used every ay, the cheese-maker would require to keep three tins in use. f the milk in one of these tins is inoculated with a pure ulture on the evening of the first of the month, the milk is tirred from time to time, and the culture will be used the ext night to inoculate the evening's milk. A portion, however, nust be kept over and immediately used to inoculate a tin f previously sterilised milk, so that this may be ready to se for inoculating the evening's milk on the second day. Only n some such manner could a pure culture be used in every-lay practice. Experiments were made to see how this would vork, and to determine the amount of inoculated milk which night be used, and at what temperature the culture should be ept during the twenty-four hours it was in the tin. The experiments were far from satisfactory, and had to be stopped before ny definite, or rather final, results were obtained, for reasons vhich will be detailed later on in this Report. The first experiment was made by using ½ gallon of milk in the tin and keeping the inoculated milk at a temperature varying from 75° to 85° Fahr. during the night, and up to 95° Fahr. during the day. The result was the development of too much acidity, nd only one quart of the culture was used for inoculating the vening's milk. The excessive acidity in the evening's milk, vhich in the morning amounted to ·37 per cent., demanded—s will be seen by the following extract from the diary—hat exceptional skill in making the cheese, which Miss Cannon ortunately possesses. "Acidity of mixed milk ·29. Renneted t 7.25 A.M., using one part to 6,000 of milk. Curd cut 7.43, nd broken 7.48. Acidity of whey, then, ·24. First scald on t 8.15, temp. 90° Fahr. Second scald at 8.35 A.M., temp. 98° Fahr. Stirred for ten minutes, and in scald forty minutes. Whey drawn 8.55, when acidity was ·26. Curd was not piled, eing too tough, but was spread out, partly in tub, and partly n rack in cooler, and cold water poured over it. Then tied up in bundles, cut twice, and turned four times, at intervals of five to ten minutes. Acidities of liquids from cooler:—

After 1st cutting..	·52 per cent.
„ 2nd „ ..	·66 „
„ 1st turning	·72 „
„ 2nd „	·77 „
„ 3rd „	·85 „
„ 4th „	·90 „

Then ground and salted in usual proportion, using 2 lbs. salt; yield, 82 lbs. curd from 90 gallons of milk. Vatted

11.20 A.M. Acidity of liquid from press ·74, and very little of this liquid ran. Curd was slightly fæcal, which would account for acidity going back so much."

In the second experiment, both the temperature at which the inoculated milk was kept, and also the time after inoculating, were reduced. Only one quart of milk was used, which was inoculated at 10.30 A.M., kept at a temperature of 85° Fahr. for ten hours, and placed in the evening's milk at 8.30 P.M., the acidity then being ·27 per cent. Next morning, the evening's milk had an acidity of ·33 per cent., and the mixed milk 0·23 per cent. It was renneted at 7.35 A.M.; cut at 8; broken at 8.5. First scald on 8.45, temp. 90° Fahr. Second scald on 9.10, temp. 100° Fahr.; stirred five minutes, and settled ten minutes. Whey drawn 9.25. Curd not piled; twice cut, and turned five times. Ground and vatted at 12 (noon). Acidities:—

Whey after breaking	·17	per cent.
„ when drawn	·23	„
Drainings after 2nd cutting	·55	„
„ „ 2nd turning	·71	„
„ „ 4th „	·85	„
Liquid from press	·89	„

Other experiments have been made, which all show that the use of a pure culture to be applied to the evening's milk, under the conditions which at present exist in the cheese dairies of Somerset, is attended with considerable risk, even when the culture is kept at the ordinary temperature of the dairy for the twenty-four hours which must elapse between inoculating the culture and inoculating the evening's milk. In all these experiments, however, it was evident that the use of a pure culture of Bacillus acidi lactici diminished any taint which might be in the milk. But on no occasion, either this year or in former years, have I ever obtained by the use of a pure culture of the Bacillus acidi lactici that nutty flavour or aroma which is the great desideratum in Cheddar cheese. Hence [illegible] think I am justified in stating that the first consideration [illegible] with the cheese-maker must be to keep the milk [illegible] this is done, the stale whey from the preceding day [illegible] used, as it has been from time immemorial, to obtain [illegible] results which come from having in the mixed [illegible] ent number of lactic-acid-producing bacteria. For, [illegible] years ago, if the milk is originally free from [illegible] taken from the tub immediately after breaking, [illegible] ly free from bacteria other than the Bacillus acidi [illegible] actically a nearly pure culture.

(c.) THE VINEGAR TAINT.

For several years past one of the taints which has given much rouble from time to time has been that designated the vinegar aint, because the curd and the whey acquire a peculiar smell, which is more like vinegar than anything else.

Miss Cannon, whose sense of smell is more acute than mine, ells me that there are several varieties of the vinegar taint.

Bad, however, as this taint has been in years past, it has never been so bad and so constant as it was at Fenswood Farm.

In the Report for 1896, a micrococcus was described which in some experiments then made produced a vinegar taint.

It was therefore surprising that when the taint was most marked at Ashton, this micrococcus could not be found in the curd. This led me to search for another organism, capable of producing the taint, but, in spite of every effort and long continued bacteriological work, the cause of this taint could not be discovered. As frequently happens, however, that which baffles the most persistent efforts of investigation is discovered by what may almost be termed an accident. So it was in this instance. When making experiments with the pure cultures of Bacillus acidi lactici it was decided to use for each experiment a culture from a different source to those previously employed. Thus it was, that on one occasion, instead of obtaining the results expected from the use of a pure culture of the actic acid bacillus, we were surprised to obtain a most powerful vinegar taint. The result of this experiment will best be realised f I quote from the notes made in the diary at the time:—“Tin of milk inoculated with No. 24 b. at 7 A.M., kept in dairy at 67°–70° Fahr. Evening's milk inoculated at 8 P.M.; the culture had a strong smell. Next morning the evening's milk smelt strongly of vinegar, and had 0·20 per cent. acidity. Miss Cannon says she never smelt vinegar taint so strong in milk before. The process went on very quickly, the curd being vatted at 12.10. The vinegar taint increased in strength rapidly, and the smell filled not only the dairy but the whole house. It was what Miss Cannon calls the *stale* vinegar taint. The curd, when placed immediately beneath the nose, smelt strongly of bay or laurel leaves.”

Now how came it that this organism had escaped attention before? In studying plate cultures of bacteria, it is possible to distinguish to a very great extent the different varieties present, owing to the very varied appearance which they present. The Bacillus acidi lactici, which for the most part forms colonies growing in the depth of the gelatine, is characterised and well known to anyone who is studying milk or cheese bacteria, and as a rule is not further studied. But the experiments on pure cultures necessitated a number of these Bacillus acidi lactici colonies on the plate being taken for further study, and for the preparation of the necessary pure cultures. It now turns out, that the organism producing the most marked vinegar taint is almost identical with the Bacillus acidi lactici, not only in growth on the plate, but also in the pure culture on gelatine. Under the microscope its shape is almost identical with that of the Bacillus acidi lactici, and when grown in milk it causes the milk to curdle in almost the same time as the Bacillus acidi lactici. Hence it is not to be wondered at that this organism had escaped our notice in previous years. However, once having found it attempts were made to distinguish it from the Bacillus acidi lactici by the ordinary means of cultivation, but without success, except that it was easily detected in a milk culture by the pungent vinegar smell which it produced.

The result of the experiment which produced the vinegar taint at once put a stop to further experiments with so-called pure cultures of Bacillus acidi lactici. It became necessary to investigate the cause of this exceptional and unlooked-for result. My first thought was that in some way the pure culture had become contaminated. New plate and sub-cultures were therefore prepared, then the organism was grown in large quantities and further experimental cheeses were made, until at last there could be no doubt as to the cause of the vinegar taint. The progress of such work is very slow at the best, and when experimental cheeses have also to be made, time passes rapidly before one can be certain of the results. So that by the time sufficient evidence had been obtained to prove the cause of the vinegar taint, the cheese-making season was too far advanced to again return to the question of pure cultures.

Some Causes of Taints.—To discover the origin of taints is one of the most difficult problems which the investigator of cheese-making has to attack. It is easy to say that the cause of bad taints is dirt, but the question still arises, whence [illegible] dirt, and why should it have the peculiar nature [illegible] undoubtedly possesses?

During the autumn and winter of 1897 there were several outbreaks [illegible] typhoid fever in England. Here was a disease produced [illegible] definite organism which is well known to bacteriologists, and can be easily discovered in any substance h contains it. Yet every one now knows how difficult roved to discover the cause of these outbreaks, to trace the oid bacteria to their source. Those who are versed in y matters will readily understand the difficulty of tracing source of bacteria which are injurious to cheese. Many of e have not yet been discovered. Even those which are wn have been so slightly studied, as compared with the hoid bacillus, that it is not yet possible to trace them to r source.

peaking generally, whatever soils the hands of the milkers certainly contaminate the milk. Hence it is necessary to w attention to the dirty state of the milk stools on most ns. One of the first things done at Fenswood Farm to try prevent the milk being contaminated was to have all the k-stools well scrubbed, and every endeavour was made to p them clean during the cheese-making season. Difficulty lso certain to arise if the cows come into sheds to be milked, these sheds are not kept scrupulously clean. The necessity eeping the cows out of contaminated and dirty streams and ds has been insisted upon over and over again in former orts. Thus the majority of taints are undoubtedly pretable.

(*d.*) SEASON AND LOCALITY.

ne of the most striking results of my investigations in past rs has been to show the great difference which exists between bacteria found at one School and those found at another. ach School certain bacteria were found which had not been with before, and even the bacteria at any one School ed at different times of the cheese-making season.

ne of the objects of investigation for the season of 1897 was ry and discover how far these results, which have been ribed in former Reports, were due to season, how far to lity.

o this end the occupiers of the farms, where the Cheese ool has been held since I first commenced my observations 1891, were requested to forward me samples of curd in pered bottles, and by this means I obtained simultaneously mple of curd of the same day's make, from each of the er sites of the Cheese School. This was done on three rate occasions, once in May, once in July, and once in tember. Fortunately cheese was being made at all these ies, and I have here to thank the makers for sending the ples.

The samples were forwarded—

By	From	Site of School in
Mrs. J. D. Armstrong	Vallis, near Frome ..	1891
Miss Tilley	Axbridge	1892
Mrs. Bethell	Butleigh..	1893
Mrs. J. Peters	Mark	1894
Mrs. G. D. Templeman	Haselbury	1895
Mrs. Tucker	Cossington	1896

Plate and other cultures of these curds were made by my assistant, Mr. Wm. D. McCreath, the moment they reached him at Long Ashton, he having been previously instructed to prepare for them, so that there might be no delay in their investigation.

As soon as the colonies on the plate cultures were sufficiently advanced in growth, I went down to the Cheese School to examine them. The plates were merely numbered, so that I might not know from whence each came. From the peculiarities of the colonies on these plates, I was able at once to pick out at least two or three and state whence they came. The plate of the curd from Haselbury was the one most easily distinguished, and next came those from Cossington, Mark, and Axbridge.

There was not, so far as my memory served me, any striking characteristic about the plate from Butleigh, except on one occasion; whilst the plate from Vallis I was not once able to discover. No two of the plates were alike; on each there were, more or less, characteristic colonies. Of course, the lactic acid colonies preponderated, for the time which had elapsed between the posting of the curd to my assistant and the examination of the same by him was sufficient to develop the acidity considerably, with the probable result of destroying some of the bacteria which would have been found, had the plate been made the moment the curd was ground.

Upon subsequently making inquiries of Mr. Armstrong (Vallis) as to whether the cheeses he had made in 1897 were different in any way to those he had made in preceding years—for the bacteria present in the curd were such as have invariably been present in tainted milk—I received a long letter from him, from which I extract the following:—

"Respecting the bad taints we had in June. There are three sources we think we may have got the taint from.

"1. Our cow-stalls are not so good as we could wish, and we

e some trouble in keeping them clean and free from smell
ery hot weather.

2. Through the hot weather of this summer the cows were
l of getting into a pond, and sometimes got some of the pond
on their teats.

3. We have been feeding a field that was sown the year the
ry School was here, and that field contains a lot of weeds,
uding a large quantity of ox-eye daisies. The reason we
k it might be caused by this is, we fed the same field some
years ago, and had a similar smell in the cheese; my wife
ld smell it quite plainly when breaking down the curd.

I may say we take every possible care with the milking,
ing the cows teats washed when dirty, and provide the
kers with pinafores, which are washed every week. We also
e the milking-stools washed every other day.

Last year we had a splendid lot of cheese, we took three first
zes, and sold four months' cheese at 75*s.* per cwt. We have
been so fortunate this year; we have a very good lot of
y, August, and September cheese, but through May and June
had these bad taints, and do what we would we could not
p them."

t appears to me that the second cause suggested by Mr.
nstrong is by far the most probable one.

he results of these investigations are, in my opinion, con-
sive upon one point, namely, that the reason why certain
teria have been found at one School and not at another is
to local and not to climatic causes. It must not be
posed for a moment that climatic conditions have no effect;
at present, we can only attribute the *fluctuations* in the
ieties of bacteria which take place at each School during
seven months' season of cheese-making to climatic con-
ons.

he problem of far greater importance is, why should different
lities be infested with different bacteria, whence do they
e, and what conditions preserve them in one place, whilst
thers they are not to be found, or at most only rarely?

t is impossible for me to record these facts without recog-
ing that they are quite opposed to what I had expected; that
y throw a new light altogether upon the problems of cheese-
king, and open up once again the question as to whether the
versal belief among cheese-makers, that it is more difficult
nake cheeses in some localities than in others, may not have
egitimate foundation. Still one cannot consider that the
ning-up of this question once again is altogether a retrograde
. The object of these investigations has been merely to

discover the truth. In the past, because we could not find, either in the chemical analysis of the soil or in the botanical examination of the pastures, any support for these local suppositions, we were led to doubt their being founded upon fact. And we were justified in doing so, for it must not be forgotten that either to the soil or to the pasture all difficulties were invariably attributed.

We ought not to assume, from the results of the few experiments recorded in this Report, that the matter is conclusively settled either one way or the other. We must be content to await patiently the result of further investigations.

XIII.—*Annual Report of the Society's Consulting Chemist*

(Dr. J. A. Voelcker, M.A., F.I.C., &c.).

During 1897 sixteen samples in all—the same number as in the year preceding—were submitted to me for analysis, by Members of the Society. These were:—

Linseed Cakes	3
Cotton Cake	1
Compound Cakes	2
Manures	2
Soils	3
Waters	5
	16

There were, in addition, eight other samples analysed in connection with the Society's Grass Experiments, viz., one of grass, two of water, and five of manures.

The three linseed cakes sent were all pure. One case is, however, interesting, by reason of its showing the variations that may occur in the quality of linseed cake actually delivered in fulfilling a contract. For an estate in Hampshire a contract had been made for the supply of twelve tons of linseed cake, this being stated by the vendors—a firm in Mark Lane—to be [illegible] American linseed cake, analysis shows 14 per cent. [illegible] Th[illegible] one of the finest and richest cakes ever imported, [illegible] would accept 8*l*. per ton at your Station." On arrival [illegible] cake, the delivery appeared to be made up of two [illegible] kinds of cake. Accordingly, samples of these were [illegible] and sent for analysis. They gave the following results:—

—	No. 1.	No. 2.
Moisture	13·40	11·48
Oil	16·20	10·43
*Albuminous compounds	29·06	32·81
Mucilage, digestible fibre, &c. ..	30·20	31·84
Woody fibre	6·04	7·60
Mineral matter (ash)	5·10	5·84
	100·00	100·00
*Containing Nitrogen	4·65	5·25

It will be noticed that the two kinds of cake differed very materially as to the amount of oil contained.

The sample of cotton-cake submitted was one of decorticated cotton-cake; but it was not at all a nice one, being very imperfectly decorticated.

The two compound cakes gave respectively 7·47 per cent. and 9·01 per cent. of oil; but it is to be remembered that in these mixed cakes the oil is derived mainly from other materials than linseed, and has a very different value to the oil derived solely from linseed. In many cases rice oil—which has very small feeding value—is the main oleaginous principle, and farmers are very apt to be led astray by merely seeing a high percentage of oil quoted in a circular, but without inquiring whether it is "linseed" or other oil of high feeding value.

It is somewhat remarkable that no samples of basic slag were sent for analysis. The use of this manure has largely increased; but, at the same time, samples of inferior quality have come forward in order to meet the demand, and it is necessary to pay attention to securing the quality guaranteed.

One sample of manure sent was a phosphatic guano, containing about 56 per cent. of phosphates and 1 per cent. of ammonia. The other was a manure sold under the name "Dissolved Bones," but composed as follows:—

Water	12·43
*Organic matter, and loss on heating ..	22·93
Monobasic Phosphate of Lime	8·56
equal to "Soluble Phosphate"	(13·40)
Insoluble Phosphates	6·13
Sulphate of Lime, &c.	27·21
Sand	22·74
	100·00
* Containing Nitrogen	1·34
Equal to Ammonia	1·62

This was not "Dissolved Bones" at all, but an inferior bone manure, of which nearly 23 per cent. was sand and earthy matter.

Of the five waters sent three were good and pure, one fairly good, and one—the following—of unusual composition:—

	Grains per gallon.
Total solid constituents	151·48
Oxydisable organic matter	·33
Nitric Acid as Nitrates	29·22
Chlorine	11·61
Equal to Chloride of Sodium	19·13
Free Ammonia	·002
Albuminoid Ammonia	·003

The solid constituents were mainly lime and magnesia salts—sulphates in particular being present in large quantities. A water with so much of these constituents is, on that account alone, unfit for regular drinking, and its hardness is very excessive. This sample, moreover, was badly polluted.

XIV.—*Annual Report of the Society's Consulting Botanist* (Mr. W. Carruthers, F.R.S.).

During the past year I have had only three applications for examinations of seeds from Members of the Society. These referred to the quality of seeds, and there was nothing special in relation to them. A sample of Red Clover contained the seeds of Dodder, which, though very small in amount, were sufficient to condemn it. A sample of "Mixed seeds" consisted of 88 per cent. Italian Rye-grass, 10 per cent. Perennial Rye-grass, and 2 per cent. the seeds of weeds.

Several applications have been received from the South-West of England, but the applicants have not specified their relation to the Bath and West and Southern Counties Society. I am at present investigating a case of the destruction of Clover by a parasitic fungus which was sent from Gloucester.

The Members of the Society certainly do not take advantage of the arrangement made by the Society for the examination of seeds as they might be expected to do.

V.—*The Society's Exhibition at Southampton.* By THOS. F. PLOWMAN, Secretary and Editor.

IE Society's 1897 Exhibition at Southampton was opened on onday, May 24, and closed on Friday, May 28.

A plan showing the situation and arrangement of the Show ard will be found facing the title-page of this volume.

ANNUAL MEETING OF MEMBERS.

At the Annual General Meeting of Members, held on the third ay of the Show, in the Council Pavilion, the following Report f the Council was received and adopted:—

The Council, in presenting their Annual Report, congratulate the Iembers upon meeting once more at Southampton, where, under 1e Presidency of the late Earl of Carnarvon, the union of the old ath and West Society with the Southern Counties Association was elebrated in 1869. In accordance with the terms of the amalgaıation which was then inaugurated, the Society has since held xhibitions in all the Southern Counties.

The success which has attended this extension of the Society's rea of operations is shown not only by an increased membership, ut also by the remarkable growth of its annual Exhibitions.

In 1869 the entries of agricultural stock and produce numbered 86; in 1897 they are 1,708; 8,500 feet of ground sufficed for the nplements and machinery then exhibited; whereas to-day they ccupy 21,885 feet.

In 1869 there was neither a dairy nor any dairy produce in the how Yard, nor were butter-making, milking, or shearing compeitions included in the prize schedule; now these are prominent and nportant features, exciting much interest.

The Society's sphere of work, apart from the Show, has been imilarly enlarged, especially in the direction of practical education nd scientific research.

During the past year the Council have continued their efforts for he promotion of Technical Education in Agriculture by organising nd conducting, on behalf of the respective County Councils, a Butter chool for Devon, a Cheese School and a Farriery School for Somerset, nd a Cheese School for Dorset. The Council are glad to be able to tate that those for whom the instruction was primarily intended ave not failed to take advantage of it, as has been shown by the ttendance of pupils.

The Council are also following up the practical and scientific investigations, initiated by the Society a few years since, in con-

nection with Cheese-making and Cider-making, the experience of previous years having fully satisfied them of the value of these researches. Particulars of the results obtained have been published in recent issues of the Society's Annual 'Journal.'

The experiments upon the improvement of grass land, which were set on foot in 1895, are in progress, and attention is being especially directed to the cause and effect of "teartness" in land.

The Board of Agriculture has once more borne testimony to the utility of the experimental and research work of the Society by awarding a grant of 300*l.* in aid of it.

The total number of Governors and Members standing in the Society's books at the beginning of the current year was 1,224, as against 1,278 in the previous year, but forty new Members have since been elected.

The Council regret that death has deprived the Society of one of its Vice-Presidents, viz.:—Lord Fitzhardinge (who was President in 1893).

The Council have gratefully to acknowledge the receipt of special prizes from the Southampton Local Committee, the Shire Horse Society, the Hunters' Improvement Society, the English Jersey Cattle Society, the English Guernsey Cattle Society, the Kerry and Dexter Cattle Society, the Shropshire Sheep Breeders' Association, Sir James Blyth, Bart., Sir Walter Gilbey, Bart., and Mr. W. B. Tegetmeier.

The Council have accepted an invitation to hold the Annual Meeting in 1898 at Cardiff.

The Council have much pleasure in recommending that Lord Windsor be elected President for the ensuing year; that Lord Montagu of Beaulieu and Mr. Henry Duncan Skrine be elected Vice-Presidents of the Society; and that the gentlemen named on the Agenda Paper be elected Members of Council for the years 1897-9 in room of those retiring by rotation.

The Council desire to express their thanks to the inhabitants of the town and neighbourhood of Southampton, and especially to the Members of the Local Committee, for the cordiality with which they have welcomed the Society, and the energy they have displayed in promoting the success of the Meeting.

Resolutions were passed adopting the recommendations contained in the Report with reference to the appointment of officers; and special votes of thanks were accorded to the Local Committee, the Judges, the Railway Companies, the retiring President, and the Secretary.

ENTRIES.

The following is a comparative statement of the entries in the various classes. Owing to the prevalence of swine fever, of Pigs could not be received in either 1895 or 1896, 1897 they were able to be admitted:—

—	Taunton, 1895.		St. Albans, 1896.		Southampton, 1897.	
:—						
ultural	72		107		59	
ers, Hacks, Ponies, and Harness..	64		113		64	
	—	136	—	220	—	123
:—						
n	48		42		55	
thorn	68		77		48	
ford	38		48		30	
x	34		44		28	
y	163		168		178	
nsey	71		109		88	
deen Angus	4		22		7	
y and Dexter	41		27		39	
er Test	23		37		32	
	—	490	—	574	—	505
.. ..		212		236		205
.. ..		..		..		109
.. ..		..		42		..
Y		406		443		397
PRODUCE:—						
se	164		114		146	
er	206		167		167	
m	11		13		12	
	—	381	—	294	—	325
SEPARATORS, &c.		3		6		4
.. ..		39		51		44
TITIONS:—						
er-Making	283		137		122	
ing	113		38		80	
ring	38		22		19	
ing	17		24		11	
	—	451	—	221	—	232
		2,118		2,077		1,944

st of the Awards, names of the Judges, &c., will be found es i.–lxi. of the Appendix to this volume.

CIDER.

parate Report dealing with this section of the Exhibition found on pages 96–109.

PRIZES.

following table shows how the money prizes were ioned at the 1897 Exhibition, and also, for purposes of rison, at the 1895 and 1896 Exhibitions:—

——	Taunton, 1895.			St. Albans, 1896.			Southampton, 1897.		
	£	s.	d.	£	s.	d.	£	s.	d.
Horses	567	0	0	644	0	0	540	0	0
Cattle	1,290	10	0	1,260	10	0	1,238	10	0
Sheep	492	0	0	465	0	0	478	0	0
Pigs	..			..			260	0	0
Goats	..			34	0	0	..		
Poultry	188	0	0	188	0	0	159	10	0
Dairying	384	10	0	324	10	0	294	5	0
Shoeing	24	2	0	22	0	0	40	0	0
Shearing..	20	0	0	20	0	0	20	0	0
Miscellaneous	36	0	0	23	17	0	..		
Totals	3,002	2	0	2,981	17	0	3,030	5	0

The Money Prizes were contributed as follows:—

		£	s.	d.
By the	Bath and West and Southern Counties Society	2,910	15	0
„	Southampton Local Committee	50	0	0
„	English Jersey Cattle Society	30	0	0
„	Hants County Council	18	0	0
„	Kerry and Dexter Cattle Society	10	10	0
„	Shropshire Sheep Breeders' Association ..	9	0	0
„	English Guernsey Cattle Society	2	0	0
		3,030	5	0

Gold, Silver, and Bronze Medals were also given by the Society, and Medals or Plate by the Shire Horse Society, Sir James Blyth, Bart., Sir Walter Gilbey, Bart., Mr. W. B. Tegetmeier, the Hunters' Improvement Society, English Jersey Cattle Society, and English Guernsey Cattle Society. The Hants County Council also gave two Scholarships of 6*l.* each, and two Scholarships of 3*l.* each in the Hants County Council Butter-making Class.

IMPLEMENTS.

The following is a comparative statement of the space occupied by Implements, Machinery, &c.:—

——		Taunton, 1895.	St. Albans, 1896.	Southampton, 1897.
Machinery in Motion Shedding,	feet run	1,190	1,190	1,064
Agricultural Implements Shedding	„	4,550	4,155	3,645
Seeds, Cattle Foods, &c., Shedding	„	877	694	791
Carriages, &c., Shedding ..	„	710	595	675
Open Space	sq. feet	18,150	16,238	15,710
		25,477	22,872	21,885

MISCELLANEOUS DEPARTMENTS.

A fully equipped Working Dairy formed as usual a prominent feature of the Show. The Butter-making Competitions were held in it, and butter-making demonstrations were given daily by Professor Carroll, of Glasnevin, assisted by the Society's Dairy School Teachers.

There were also Shoeing, Shearing, and Milking Competitions, which attracted many spectators.

The Exhibitions of Pictures, Art Manufactures, and Plants and Flowers were fully up to the average of previous years, and there was no diminution of interest in them on the part of the public. The customary Art Union was held, and a list of the prize winners and of the pictures chosen will be found on pages lxii., lxiii. of the Appendix to this volume.

Lectures on bee-keeping, combined with practical instruction, were given each day under the auspices of the Hants Beekeepers' Association. There was also an exhibition of honey, hives, and apiarian appliances.

Musical performances were given by the Bands of the Grenadier Guards and the Royal Marine Artillery.

The usual Sunday service, at which there was a large attendance of herdsmen and others engaged in the Yard, was held in the Working Dairy. It was conducted by the Rev. Canon Durst, Vicar of St. Mary's, Southampton, who also preached.

ATTENDANCE.

The total number of persons paying for admission was 42,034, as against 34,436 at St. Albans in the previous year.

A comparative statement of attendances since 1852 will be found on pages cvii., cviii. of the Appendix to this volume.

XVI.—*Investigations into the Manufacture of Cider. Report for* 1897. By F. J. LLOYD, F.C.S.

THE results of the numerous experiments which have been made at Butleigh in the past, have proved so conclusively that cleanliness is one of the most important conditions, if not the chief factor, in the production of good cider that every cider-maker must endeavour to study and adopt any improvements which may conduce to this most desirable end. First and foremost this applies to the gathering in of the fruit, which, as shown by previous Reports, should be done before the apples are ripe, while those that are collected direct from the tree should not be mixed with those which have fallen.

The season of 1897 was an exceptionally early one, and a finer period for gathering the apples could not have been desired. But, as is well known, cider-making should not commence until the season is well advanced. If the season is an early one, and the make has to be put off longer than usual, it is necessary to pick the apples before they have reached such a state of ripeness as would be permissible in a later season. This is apparent when once noticed, but it was not discovered until later in the season, and consequently the apples did not keep so well or so long as could have been desired, and a certain amount of waste and decay took place in the stores.

In spite of the publicity which has been given to the cider investigations, and the interest which has been taken in them by many of the best cider-makers—as is shown by the number who have visited the Experiment Station at Butleigh since Mr. Neville Grenville first started the investigations—it is disheartening to see how many farmers still neglect to take advantage of the work which has been done for them, and utterly ignore the necessity for cleanliness.

On the 28th of October I had occasion to travel for many miles in Somerset. It was an excessively damp morning; a very heavy dew had fallen during the night, and a Scotch mist hung over the land. In some places the apples were still unpicked, while hundreds, wet, bruised, and dirty, were lying under the trees upon the cold damp grass, a tempting breakfast for slugs and worms, and every other variety of apple-consuming life, animal or vegetable.

Every mould or fungus which came in contact with the apples was revelling in the ample store of sweet moist food they supplied, and growing apace, consuming the best part of the apples, destroying their value for cider-making, and planting in the remainder the germs of a subsequent injurious fermentation and decay.

In other places I saw men gathering the reeking wet apples, evidently intent upon making as much so-called cider as possible, utterly regardless of its quality. Now, as the same time, the same labour, and the same capital must be employed whether men make cider worth 4*d*. a gallon, or cider worth 1*s*. a gallon, it is extraordinary that a little more foresight could not have been exercised, so as to do things at the right time and in the best way.

I must have seen a hundred heaps of apples lying on the ground, with no covering to protect them from the dew or rain, and nothing underneath to check the decay and the dirt-collecting, which must of necessity take place.

People who will not take a little trouble to make good cider had better give up cider-making altogether. They destroy the reputation of cider; they cannot sell what they make; and those who drink the stuff would be better in health without it. They will learn too late that they have allowed an opportunity to slip which will not recur. How true this is may be best shown from the following facts. It has come to my knowledge that large quantities of apples were sold in Somerset last year (1897) which were taken to France for the manufacture of cider. How is it that the French cider-maker can afford to buy apples in Somerset at a price which must presumably pay the Somerset farmer better than converting them into cider, and can not only afford to give this price, but to pay the cost of carriage as well? It is simply because many Somerset farmers will not learn how to make a drink which can compare in quality or price with that made by our neighbours across the Channel. What will be the result? The demand for cider which is growing rapidly in England will induce the French cider-maker to put upon the English market a drink more suitable to the tastes of the public than that made at home, and once having gained the favour of the consuming public, English makers will be unable to oust their more enterprising rivals.

THE SEASON.

The characteristics of the season of 1897 will best be realised by the study of the following tables, which are a continuation of those published in former years, and have been drawn up from statistics kindly supplied by Mr. R. H. Scott, F.R.S., Secretary of the Meteorological Society.

For the air temperature and rainfall, the average of Hereford and Cullompton was taken in former years, but in 1897 it was necessary to take the average of Clifton and Cullompton, as no records had been made at Hereford.

These tables show a more than average amount of sunshine, especially during the month of October, an exceptional rainfall in August, a low temperature combined with a large rainfall in September, and an exceptionally high temperature in October.

The effect of the season upon the apple crop varied greatly in different localities, in some districts the crop being very small. The effect at Butleigh may be gathered from the following figures.

The total volume of juice yielded was about 3,000 gallons as compared with 1,000 gallons in 1896 and 9,000 gallons in 1895.

WEATHER REPORT, 1897.

AIR TEMPERATURE AND RAINFALL, 1897. AVERAGE OF CLIFTON AND CULLOMPTON.

MONTH.	Air Temperature.		Rainfall.	
	Min. and Max. Combined.	Difference from Average.	Total fall in Month.	Difference from Average.
April	47·0	−0·3	3·58	+1·33
May	51·9	−0·2	1·55	−0·66
June	60·7	+2·7	2·86	+0·67
July	63·7	+2·6	1·68	−1·54
August	61·5	+0·9	6·37	+3·18
September	55·1	−1·7	3·93	+0·67
October	52·0	+3·3	1·43	−2·47

BRIGHT SUNSHINE RECORD AT CULLOMPTON, 1897.

MONTH.	No. of Hours recorded.	Difference from Average.	Percentage of possible Duration.	Difference from Average.
April	136·3	−21·0	33	− 5
May	211·0	+12·3	44	+ 2
June	199·0	− 1·5	41	0
July	222·2	+48·1	45	+ 9
August	174·6	− 3·6	39	− 1
September	147·7	+ 7·7	39	+ 2
October	123·8	+29·3	38	+ 9

In one test, as to the yield of juice per 1,000 lbs. of apples, the result was 616 lbs. as compared with 615 lbs. in 1896, and 650 lbs. in 1895.

The composition of the juice as it came from the press is given in the following table:—

AVERAGE COMPOSITION OF JUICE FROM PRESS.

Year.	No. of Samples.	Specific Gravity.	Solids.	Acid.
1893	6	1·060	14·40	·63
1894	11	1·050	11·14	·60
1895	13	1·052	12·24	·46
1896	5	1·057	14·02	·40
1897	10	1·053	13·26	·68

It will be seen that the characteristic of the apple-juice in 1897 was a high percentage of acid, while the total solids were higher than in 1895, but below those of 1893 and 1896.

			apples.								
			oz.		per cent.	per cent.	per cent.	per cent.			
New Cadbury	1897	135	2·3	1·0539	12·68	·96	10·74	·174	R. Neville Grenville	Butleigh	S.
	1896	102		1·0598	14·84	·40	13·09	·180	Do.	Do.	
White Jersey	1897	136	2·54	1·0519	12·68	·26	12·08	·210	Do.	Do.	
	1896	114	2·87	1·0581	14·68	·22	13·25	·150	J. C. Waterman ..	Baltonsboro'	S.
	1895	29		1·0600	14·92	·13	13·88	·170	H. G. Bethell	Butleigh	S.
Blenheim Orange	1897	139	3·5	1·0683	16·64	·79	14·14	·140	R. Neville Grenville	Do.	
	1895	39		1·0575	13·74	·58	12·98	·090	Do.	Do.	
Horners	1897	140		1·0560	13·84	·25	13·48	·316	Do.	Do.	
	1895	50		1·0554	13·58	·31	12·19	·190	Do.	Do.	
Red Jersey	1897	159	2·66	1·0596	14·50	·30	13·88	·124	J. C. Waterman ..	Baltonsboro'	S.
	1896	112	3·10	1·0616	15·64	·23	14·10	·290	Do. ..	Do.	
	1895	10		1·0660	16·14	·16	14·92	·240	R. Neville Grenville	Butleigh	S.
Kingston Black	1897	160	2·3	1·0606	14·86	·48	13·88	·126	J. C. Waterman ..	Baltonsboro'	S.
	1896	111	1·70	1·0691	17·30	·34	15·06	·140	Do. ..	Do.	
	1895	8		1·0672	16·60	·64	14·08	·110	R. Neville Grenville	Butleigh	S.
Nortons Bitter	1897	162	2·6	1·0532	13·28	·20	12·50	·230	R. W. Scott	Kingsbury	S.
	1896	124	2·50	1·0740	18·60	·30	16·66	·310	J. C. Waterman ..	Baltonsboro'	S.
	1895	11		1·0660	15·74	·24	14·70	·410	F. J. Hayes	W. Pennard	S.
Chisel Jersey	1897	163	2·9	1·0542	13·50	·31	12·82	·264	R. W. Scott	Kingsbury	S.
	1895	21		1·0620	15·14	·20	14·49	·350	J. H. Symes	Martock	S.
Colebrook	1897	172	3·3	1·0550	13·40	·23	12·98	·126	Do.	Do.	
	1896	107		1·0608	15·48	·42	13·41	·300	R. Neville Grenville	Butleigh	S.

ANALYSES OF APPLES.

In the Appendix will be found a continuation of the analyses of apples commenced in 1895. An attempt has been made to determine the percentage of juice yielded by each variety, and the results are somewhat astounding, showing a variation of from 40 to over 70 per cent. of juice. In my Report for 1896 attention was drawn to the fact that the same variety of apple gave in 1896 a juice of very different composition to that yielded in 1895. The same peculiarity has been found again in 1897, and the table on the preceding page will illustrate how great the difference is.

MANIPULATION.

While the apples were fed to the mill as usual from the loft along the trough, described in a former Report, an addition was made to the trough which proved most valuable as a means of ensuring the further cleansing of the apples. This consisted of putting into the trough a false bottom of semicircular laths. The laths are fixed to narrow strips of wood, which raise them off the bottom of the trough so that they form a grating. This is made in lengths of 3 ft. One length could thus be removed at a time for clearing out the refuse which had accumulated beneath it. The laths ran parallel to the sides of the trough, about 1½ in. apart.

In the pressing of the pomace further experiments were made with the thin cloths mentioned in previous Reports, and the results have been most satisfactory.

Although it cannot be expected that a thin cloth will last so long as the thick manilla cloths now generally used, yet the outlay which the latter entail, and the great care needed in keeping them clean—for labour is a serious consideration on many farms where cider is made—probably prevent makers from doing away with the old reed system.

But it must be done away with, not only by those who desire to make the best cider, but also by those who wish to do this with the least possible trouble. The thin cloth used in these experiments is known as Netting Shading, and can be purchased in lengths of 30 yds., either 54 or 72 in. wide, the latter for 35*s.* a length.*

To facilitate the clearing of the juice under conditions which should be not only regular but also under control, Mr. Neville Grenville has constructed a separate keeving-room, which can, by means of a small "tortoise" stove, be kept at a regular temperature. Such a room is of greatest value during a very old season, and the mild temperature of the latter part of 1897 revented any series of experiments being made upon the nfluence of temperature in keeving.

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* Quotation of Messrs. J. Blackburn and Sons, Wormwood Street, London.

As an outcome of these investigations, one further change ad been made at Butleigh, the cellars had been completely earranged, so that no barrel should be standing on its end.

I understand that some correspondence has taken place in he public press as regards the desirability of thus arranging he barrels. My reasons for advocating this change were given ully in former Reports, and need not be here repeated. But I would like to draw the attention of those who are not yet convinced to some articles which appeared in November and December, 1897, in the illustrated journal 'Commerce.' In these articles will be found interesting descriptions of some of the principal wine-producing factories in the world. One of the most striking facts which may be gathered from the illustrations to these articles, is that nearly all the barrels are lying down. The only exceptions seem to be the very large blending vats employed, and even these are not always upright. Thus the large vat of Messrs. Moet and Chandon, of Epernay, which holds 12,000 gallons, is not on end, and in the photographs of the vatting-room of this same firm not a single barrel can be seen on end, though in places they are stacked in five rows. Surely this arrangement adopted by the old-established wine manufacturers cannot be due to any accident, but is done deliberately and with a purpose; and is a strong confirmation of the desirability of keeping the barrrels on their sides. I must therefore repeat my advice to cider-makers and say, if you wish the cider to keep, the barrels must not stand on end.

The above are the conditions under which the cider was made last season. In all other respects the work has been carried out as in 1896.

FERMENTATION.

The most marked peculiarity of the season 1897 has been the fermentation of the juice when in the keeves. The object of keeving is to carry out the first clearing of the juice. This is accomplished by the fermentation causing a large quantity of the pomace to rise to the surface of the juice, from which it is easily skimmed. This pomace produces under ordinary circumstances a thick, brown head; but, throughout the whole of the 1897 season, except in two instances, the juice refused to throw up this brown head, and produced instead a thick white and frothy head, somewhat similar to that seen upon a brewer's vat. In these two instances brown heads were formed, and why they were produced no observation could

enable us to determine. When this brown head was
—which it may here be stated is considered desirable, w
white head is considered objectionable—the lees were le
keeve when the juice was drawn off into barrels, and n
was pumped upon these lees, which, however, then pr
white frothy head, similar to that in the remaining
Continuous and numerous experiments have been ma
and discover the cause of this phenomenon.

Some negative results, as showing what does not pro
frothy head, may first be mentioned. It is not due to
perature of the juice in the keeve, as experiments ha
made at high and low temperatures without the lea
The fermentation, however, both in the keeve and subs
in the barrel, was much slower with the juice keeved
temperature.

So far as can be judged, it does not appear to be du
juice, as it came from the press, containing less pomace
former years.

The difficulty is to explain why the pomace did not
is said that the reason why the pomace rises to form th
head is that the yeast-cells, being attached to the skin
apples when they start fermentation, produce sufficien
cause these particles of apple skin to rise. We may t
assume that, as when the head is white the apple skin
rise, the yeast-cells, having been in such a conditio
become easily detached or washed from the skin, w
in the juice and so the gas ascended alone. The
conditions would also appear to favour this view.
some of the yeast-cells are capable of being wash
the skins of the apples, they would be so washed in
season; while in a season like 1897, owing to the ve
rainfall in October, they would remain on the app
washed off in the juice from the press. In some
this assumption is borne out by the results of obs
Thus, if the yeast-cells were spread throughout the
one would expect fermentation to be more rapid
they were attached to the skins of the apples. Unde
fermentation in the keeves was more rapid than usu
experiment made, however, did not quite accord w
surmise, for some of the juice was inoculated with
yeast, to determine what effect that would have, and a
head was the result. Another possible cause migh
presence in the juice of a top fermentation yeast. I m
explain that there are two distinct types of yeast. Th
remain at the bottom of the liquid which they ferment;
like much of the brewer's yeast, which rise to the to

iquid and carry on fermentation from above. The brewer's yeast, as is well known, produces a froth. Microscopical examination of the white frothy heads showed them to contain an abundance of yeast-cells. Some of these yeasts have been solated, and experiments will be conducted with them to determine how far they may be the cause of this phenomenon.

I think it not altogether improbable that cider made from such uice will have a tendency to go sour. Microscopical examination of the froth shows that it contains numerous bacteria, which are being investigated. It occurred to me that perhaps a combination of the bacteria of lactic or acetic acid fermentation with the yeast fermentation caused the white head. Some experiments were consequently made in the laboratory at Butleigh, and apple-juice was inoculated with yeast and one or other of these bacteria, but the result was disappointing, as no frothy fermentation was obtained, nor any evidence in support of the above assumption. So the cause yet remains doubtful. How far, and why, it may be due to the influence of season is yet a mystery, but it can scarcely be due to any other cause, unless it is to the fact of the apples having been stored longer than usual before grinding. One other possible cause which had not escaped attention should be mentioned, viz.: the possibility of there being some chemical substance in the juice which gives it this property of frothing, just as soap gives the property to water. If there is such a substance, it must be present in minute quantities, and as yet I have not been able to discover it.

But why is a white frothy head considered undesirable? The universal opinion is that cider showing this peculiarity will not keep. We have had this frothy head in former years, but then it was the exception and not the rule. However, to test this question of keeping, some experiments were made. Two juices from cheeses pressed about the same day and from keeves standing side by side, one having a brown head, and the other a white frothy head, were placed in barrels side by side and kept under the same conditions. In due course they were carefully examined, and the cider from the juice having the white frothy head was not considered to be in any degree inferior to that made from the juice with the brown head. In fact, I may go so far as to say that by some it was considered better.

But I can well understand why and how this white frothy fermentation has obtained a bad repute. It is undoubtedly a sign of rapid fermentation, not only while in the keeve but subsequently in the barrel. Hence, it is imperative to watch the fermenting juice, to rack it sooner and more frequently than juice which ferments more slowly, and to keep the air away from it with scrupulous care. And these are just the rules which the careless cider-maker will not observe. He uses no saccharometer to tell him how the fermentation is proceeding, and so he leaves the juice to proceed as it will until the time which he thinks proper for racking arrives; a time which does not depend upon the condition of the juice at all, but which he found beneficial perhaps once years ago, or which suits his convenience, or, may be, which his great-grandmother considered a certain guide to the production of good cider, and left as a legacy to posterity.

As to the practical lessons to be learnt from these experiments and observations, it would seem that if once the juice throws up a white frothy head there is no object in keeping it in the keeve, for keep it there as you may it will not subsequently throw up a brown head. As soon therefore as the juice begins to clear, and the main portion of the pomace has subsided, it is best to rack it off into barrels, taking care of course not to disturb the sediment. Watch the subsequent fermentation, and do not let the air get at the juice. Rack at the earliest opportunity, and if necessary repeat the racking, and finally filter. Then, if the juice be kept in air-tight barrels, there should be little chance of the cider becoming too acid.

SMALL CIDER.

Further experiments were made to determine the relative merits of extracting the pomace with warm or cold water. These experiments were considerably influenced by the warm temperature of the season. The pomace extracted with water at 120° F., yielded a juice having an average temperature of 66° F., while that extracted with cold water had an average temperature of 52° F. The result was a far too rapid fermentation in the warm made juice, which probably would not occur in a cold season. The small juice extracted with warm water contained more solid matter than that extracted with cold water. The specific gravity of the warm extracted juice was 1·035, that of the cold 1·031, two months after the former had fermented down to 1·001, the latter only to 1·017.

EXPERIMENTS.

When making experiments it is always necessary to have in one's mind a distinct question which it is desired to put to Nature, and from her to seek an answer thereto. What are the conditions requisite in good cider, and how can they be obtained?

l the experiments which have been or may be conducted in e future, must aim at the answering of this question.

Let me first enumerate the essential conditions of good cider the order of merit or importance. First, flavour; secondly, od appearance, which includes both colour and clearness; and stly, keeping quality. How to obtain these conditions has en the object of the experiments at Butleigh.

To obtain flavour it is well known that two conditions must e observed. First, the introduction into the juice of any bstance which would impart an unpleasant flavour thereto ust be prevented. The various means which have been dopted to this end have already been described. Now, if erfect purity of the juice could be insured, then it becomes vident that the flavour of the resulting cider would depend ither upon the original flavour of the apples or apple-juice, or pon changes which took place during fermentation. The lavour doubtless depends to a certain extent upon the riginal flavour of the apples, for if cider is made from one ariety of apple only, and if this has a special, distinct, and arked taste of its own, such, for example, as the Foxwhelp, his flavour of the apple will be present in the resulting ider. Evidently, then, the flavour of other varieties of apples hich may not be so marked, must still contribute to the lavour of the resulting cider. These flavouring compounds rm an infinitely small part of the original juice, and their ue flavour only becomes marked when all the sugar has een converted into alcohol. Even then they are to a rtain extent masked by the acid present in the juice, but hen both acid and sugar are present they are considerably idden.

On the other hand, a small percentage of sugar and of acid ppear to enhance the good flavour. This is the reason why cider-akers are anxious to leave in the cider a certain amount of ugar. The tannin will also affect the flavour. Now, as the mount of sugar, acid, and tannin vary in every sample of ider, it is evident that uniformity cannot be easily obtained in bulk of liquid, unless some means exist for blending the juice ither before or after fermentation. From experiments on a mall scale which have been made at Butleigh in the past, it as been evident that, as a rule, blending the juice improves he quality. This year blending has been carried out on larger scale. The procedure has been as follows:—The ider has been made as previously described; when fit t has been racked into large barrels, and thus a thorough lending is secured. The blend is then allowed to again tart fermenting, and is subsequently filtered into casks for preservation. So far as can be judged at present, the results are distinctly favourable. Another factor which plays an important part in the production of flavour in cider is the nature of the fermentation. This has been proved by the experiments on pure yeast. In the 1896 Report, it will be seen that experiments were then started with five varieties of pure yeast. Sample bottles of the cider so made were put aside; and, on the 20th December, 1897, one year after bottling, these were tasted. The results showed that, to some extent, the flavour varied according to the character of the pure yeast employed. That made with yeasts obtained from grapes had a distinctly vinous flavour. That made with yeast originally taken from the Kingston Black apple had a slight flavour of the Kingston Black, but only very slight. That made with the pure cider yeast had more of the flavour of cider, or perhaps, it would be better to say, did not bring into the mind the idea of any flavour other than that of cider. But, in spite of these slight differences, there was an undoubted similarity between all these samples, and this I attribute to the flavour of the original apple-juice.

Next let us consider the flavour of the small cider. It is somewhat remarkable that, in the opinion of a great number of those who tasted the cider made in 1896, the small cider was preferred to the cider produced by the fermentation of the whole juice. After a careful study of all the facts, it seems reasonable to conclude that the flavour of cider very largely depends upon the non-fermentable substances present in the juice; and that if these are in excess, they will so cover the flavour due to fermentation as to materially lessen the value of the resulting liquid. If this theory is correct, it is evident that by diminishing the quantity of unfermentable material, one should improve the flavour of the resulting cider.

Why is the cider made from early gathered apples seldom, if ever, so good as that made subsequently? It was in trying to solve this problem that the influence of the non-fermentable constituents first occurred to me.

Experiments were started to test this view. Some apple-juice from windfalls was fermented as usual in one barrel, while a portion of similar juice was diluted with one-half its own volume of water—by which the non-fermentable constituents would be greatly reduced—and sufficient sugar was then added to make the liquid contain the same amount of sugar as the whole juice. The result was a better cider from the diluted juice than from the whole juice.

These experiments with early made cider have been more striking in their results than experiments carried out subseuently with what may be termed ordinary juice, though even ı the latter case benefit has sometimes resulted.

It is probable that the amount of these non-fermentable contituents depends, partly upon the season, partly upon the ariety of apple,* and partly upon the care which is taken in he management of the orchard; but on these points further nvestigation will be necessary.

The results which have been recorded seem to point to the lesirability of obtaining a "standard" composition for the juice, and of blending or diluting the entire juice, until this standard is obtained. Not until this is done will it be possible to produce a liquid which shall have the same uniformity as is now obtained in the wines of the leading manufacturers in foreign countries.

So far as one can judge from hearsay, the chief reason why cider has not become a more popular drink has been the difficulty of obtaining it of uniform quality, flavour, and colour.

It has been stated that a certain amount of sugar in cider enhances the flavour. Probably the most difficult task of the cider-maker is to retain in the juice this small amount of sugar, or, as it is often called, "sweets."

Unfortunately the desire to do so has outweighed all other considerations with some makers, more especially in Devon and Hereford; and, as often happens with things which are good in moderation, this desire having been carried to excess, has produced a greater evil than the one which it was originally intended to counteract. Those who are investigating the manufacture of cider and other fermented liquids are striving to find a natural means to retain the sugar. Failing the discovery of such a means, preservatives are being used by many, often without the least knowledge of their composition or their effect upon the human body. I am opposed to the use of preservatives, but in view of their wide employment experiments have been made to try and determine what actual benefit may accrue from their use, and what quantities must be employed to be effectual. The results of these experiments will be recorded in due course. Meantime, I can only state that by careful racking in proper time, by filtration, and subsequent care in the storage of the juice, better cider has been made at Butleigh than any I have ever tasted which has been made with the aid of preservatives.

We may now pass to a consideration of appearances. The colour of the cider has been experimented upon in the past. It depends partly upon the natural colour of the apple-juice, partly upon the freedom of this juice from extraneous substances—as for example, the juice of rotten apples—and partly on the treatment of the pomace after it leaves the mill and before pressing, for if then exposed to the air it gets darker and the resulting juice is more highly coloured. As we do not believe in highly coloured juice, precautions are taken to prevent all these sources of high colour. Clearness is more difficult to obtain, especially with cider in bottle. It can be obtained in bottle by disgorging, as is done in the wine industry; but the cost of this process would be prohibitive. It is easy to obtain a dry cider in bottle without much deposit, provided the juice is placed in the bottles immediately it comes from the filter, and is not filtered until nearly the whole of the sugar has been fermented. There is a general opinion that sugar-candy will not ferment if placed in the juice at this time, and experiments have been started to determine how far this assumption is correct. That a certain amount of fermentation should proceed in the bottle is necessary to give the cider "life," and the difficulty up to the present has been to obtain this "life" without too much deposit. The value of the filter as a first means of obtaining a clear juice has been so amply demonstrated that nothing further need be said on the subject. The want of a cheap filter still exists, and anyone who will turn his attention to the production of both a cheap and effective filter for cider will undoubtedly reap a rich reward.

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* This is well seen by studying the figures in the Appendix.

Lastly, as regards keeping quality. It has been found at Butleigh that if care is taken in obtaining the juice free from impurities in the first place, if the fermentation of the juice is carefully watched by means of the saccharometer, and not allowed to proceed too far before filtration takes place, and that if subsequently the barrels are kept air-tight, the cider not only keeps well, but improves in quality by keeping. But if the juice is allowed to ferment to dryness before it is filtered, so that no subsequent fermentation takes place to restore life to the cider, it will be far more difficult to keep. All the results up to the present go to show that the juice intended for bottling should be filtered and bottled before the gravity has sunk below 1·020, and that for storing in casks the gravity should not be lower than 1·015.

During the last season attention has been paid especially to the careful recording of the facts regarding each and every barrel of cider made, and as the result of this work I have drawn up the two following forms (pages 195 and 198), which I recommend to those who desire to keep an accurate record of their work. The form on page 198 is that of the day-book, so to speak, in which is put down from day to day the work that is done. The rm below is the cellar-book, or cider-ledger, which will have be filled up from the day-book.

If cider-makers would keep two books (the best size is fools-.p) and carefully record every day what they did, it would, I n sure, well repay the small amount of time and trouble ıvolved. Moreover, an interest would be given to the work of der-making such as they had never dreamt of.

The conditions of cider-making differ on every farm; the pples, the soil, the climate, all affect the resulting liquid. The ıost that we can do in our experiments at Butleigh is to seek ut some of the more general conditions which affect all makers; ut the special conditions which at each farm will always play n important part in the manufacture of cider, each maker must nd out for himself, and I hope that records, somewhat similar o, if not identical with the following, will be kept more requently in the future.

CELLAR-BOOK, OR RECORD OF BARRELS.

Barrel No...
Made on...
Apples from...
Condition of apples...
Specific gravity of juice...
Temperature when keeved...

Skimmed:— First time. Second time. Third time.
Date...
Nature of head...
Temperature when skimmed...

Specific gravity of juice in barrel...
Temperature of juice in barrel...
Special treatment...

Racked:— First time. Second time.
Date...
Specific gravity...
Temperature...

Filtered:—Date...... Specific gravity...... Temperature......
Condition of liquid...

Subsequent treatment...

Tasted and quality...

Remarks...

APPENDIX.

Composition of the Juice of various Apples, 1897.

		No.	Average Weight of Apples.	Percentage of Juice.	Sp. Gr.	Solids.	Acid.	Grape Sugar.	Cane Sugar.	Tannin.	Extractions Ash, &c.	Grower.	District.	
Ecklinville Seedling ..	D.	127	7·75	80	1·0517	11·20	·74	...	..	·070	..	H. J. W. Coulson	Tiverton	D.
Stirling Castle	E.	128	5·6	68·3	1·0594	14·08	·72	..	..	·070	..	Do. ..	Do.	D.
Cox's Pomona	F.	129	4·5	53·75	1·0664	14·88	·26	..	..	·100	..	Do. ..	Do.	D.
Duck's Bill	G.	130	1·8	67·5	1·0491	10·72	·42	..	..	·104	..	Do. ..	Do.	D.
Hoary Morning	H.	131	3·62	52·5	1·0571	13·36	·60	..	..	·080	..	Do. ..	Do.	D.
Bradninch Bitter	I.	132	3·87	62·5	1·0561	13·88	·20	..	..	·148	..	Do. ..	Do.	D.
Unknown	J.	133	2·73	68·75	1·0501	11·14	·50	..	..	·090	..	Do. ..	Do.	D.
Do.	K.	134	3·62	58·75	1·0592	13·86	·20	..	..	·144	..	Do. ..	Do.	D.
New Cadbury		135	2·3	62	1·0539	12·68	·96	9·06	1·68	·174	·806	R. Neville Grenville	Butleigh	S.
White Jersey		136	2·54	58·5	1·0519	12·68	·26	8·65	3·43	·210	·130	Do. ..	Do.	S.
Tom Hooper		137	3·3	55	1·0584	13·48	·96	10·17	2·17	·170	·010	Do. ..	Do.	S.
Court of Wick		138	1·96	55	1·0763	18·32	1·32	11·83	3·84	·180	1·150	Do. ..	Do.	S.
Blenheim Orange		139	3·5	64·5	1·0683	16·64	·79	10·00	4·14	·140	1·570	Do. ..	Do.	S.
Horners		140	Not average sample	70	1·0560	13·84	·25	10·94	2·54	·316	..	Do. ..	Do.	S.
Hoary Morning		141	5·5	65	1·0556	13·32	·38	9·61	2·43	·144	·756	Do. ..	Do.	S.
Pear Apple		142	3·62	52	1·0556	13·84	·24	10·87	1·47	·142	1·118	Rev. F. A. Brymer	Somerton	S.
Unknown, Butleigh No.	**10**	143	2·66	61	1·0668	16·58	·35	10·35	3·45	·220	2·210	R. Noville Grenville	Butleigh	S.
Do. do.	**11**	144	1·88	72·5	1·0540	13·66	·21	9·20	2·63	·160	1·460	Do. ..	Do.	S.

Do.	20	152	4	67	1·0658	16·36	·73	8·53	5·27	·226	1·604	Do. ..	Do.	S.
Do.	do.	153	3·02	59	1·0509	12·06	·77	7·94	3·21	·084	·056	H. T. Silcox.. ..	Do.	S.
Royal Somerset		154	5	58	1·0640	15·70	·74	10·35	4·15	·220	·240	Do.	Do.	S.
Silcox's No. 1		155	2·75	58	1·0640	15·96	·34	10·94	3·56	·288	·832	Do.	Do.	S.
Do. 2		156	3	67	1·0558	13·72	·59	8·28	2·46	·158	2·232	Do.	Do.	S.
Do. 3														
Appleby		157	3·65	73	1·0758	18·26	·83	12·34	2·92	·372	1·798	J. M. Appleby ..	Glastonbury	S.
Green Pippin..		158	2·9	71	1·0596	14·54	·33	11·90	1·98	·124	·206	Do.	Do.	S.
Red Jersey		159	2·66	68	1·0596	14·50	·30	10·87	3·01	·124	·196	J. C. Waterman ..	Baltonsboro'	S.
Kingston Black		160	2·3	67	1·0606	14·86	·48	10·64	3·24	·126	·374	Do. ..	Do.	S.
Bung Jersey		161	4	50	1·0520	12·90	·29	11·62	·57	·334	·086	R. W. Scott	Kingsbury	S.
Norton's Bitter		162	2·6	45	1·0532	13·28	·20	11·62	·88	·230	·350	Do.	Do.	S.
Chisel Jersey		163	2·9	58	1·0542	13·50	·31	11·11	1·71	·264	·106	Do.	Do.	S.
Pit Crabs		164	1·3	50	1·0487	11·48	·67	9·80	·83	·118	·062	Do.	Do.	S.
Vicarage Apple		165	2·3	52	1·0470	11·28	·33	9·80	·95	·180	·020	Do.	Do.	S.
Yeovil Apple		166	1·5	61	1·0470	11·04	·60	10·00	1·11	·156	..	Do.	Do.	S.
Tommy Rodferd		167	3	62	1·0520	12·50	·21	11·36	1·46	·198	..	Do.	Do.	S.
Willis's Bitter		168	2·1	53·5	1·0547	13·78	·27	12·50	·32	·220	·470	J. H. Symes ..	Martock	S.
Bonels		169	2·9	59	1·0580	14·14	·27	11·90	1·61	·232	·128	Do.	Do.	S.
Carter Pippin		170	4	67	1·0540	13·40	·25	10·86	1·96	·150	·180	Do.	Do.	S.
Queen Anne		171	3·3	51	1·0505	12·52	·21	10·63	1·56	·094	·026	Do.	Do.	S.
Colebrook..		172	3·3	55	1·0550	13·40	·23	11·62	1·36	·126	·064	Do.	Do.	S.
d Cap Jersey		173	1·3	63	1·0502	12·72	·20	10·86	1·33	·140	·190	Do.	Do.	S.

S. Somerset.

Record of Daily Observations at Butleigh, 1897–8.

	No. of Cheese.	Source, condition of apples, and storing, grinding, &c.	Time between grinding and pressing.	No. of Keeve.	Temp. of Keeve-room.		Juice from Cheese.		Juice in Keeve.	
					Min.	Max.	Temp.	Sp. Gr.	Temp.	Sp. Gr.
			hrs.							
Nov. 8 ..	27	Cook's Orchard—mixed sorts. Some Norton Bitters, in good condition, stored for a fortnight in loft. Pips cracked	12	1	50	55	50	1·055	50	1·055
Dec. 2 ..	53	Mixed varieties from Maidment's Orchard. Stored in hurdles for three weeks. Pips not cracked	1	5	..	..	44	1·057	44	1·057

Keeving.									When put in barrel.				1st Racking.		
1st Skim.			2nd Skim.			3rd Skim.									
Date.	Head, &c.	Temp.	Date.	Head, &c.	Temp.	Date.	Head, &c.	Temp.	Date.	Sp. Gr.	Temp.	No.	Date.	Temp.	Sp. Gr.
Nov. 11	White froth and little brown pomace.	52	Nov. 12	As before	53	..	..	..	Nov. 12	1·051	54	22	Dec. 10	51	1·029
Dec. 11	White froth	43	Dec. 13	As before	43	..	..	..	Dec. 13	1·049	43	50	Dec. 23	48	1·039

2nd Racking.			Filtering.				No. of barrel when stored.	Observations on special treatment (if any).
Date.	Temp.	Sp. Gr.	Date.	Temp.	Sp. Gr.	Flavour, colour, clearness, &c.		
..	..	..	Dec. 18	49	1·026	Good flavour, rather pale; clear, but not brilliant	22	
Dec. 28	[illegible]	[illegible]	1898		[illegible]	Very good flavour; pale,	50	Not heated in keeve-room, but left at natural

The Note-Book.

Rinderpest.—Dr. Alexander Edington, Bacteriologist to the lonial Government of the Cape of Good Hope, has made important advance in the methods employed for the prentiontion of rinderpest, which is described as follows in 'The mes.' He has found that the blood of animals affected by nderpest when treated with citric acid and kept for such a ne as to insure the death of the contagium confers immunity m the disease when injected into animals exposed to infection. n animal into which 20 c.c. of this blood were injected ceived ten days later an injection of a large quantity of blood m another animal suffering from rinderpest in a severe form thout being in any degree affected. There was not even the ghtest rise in temperature. Dr. Edington next tried bile ated in the same way and got equally good results. Adding e part of glycerine to two of bile, he kept this mixture eight days. He then injected 20 c.c. of it, and followed s up in ten days by an injection of 0·2 c.c. of the most ulent blood that could be procured, after which he found nunity established. To test this method a field experiment a large scale was tried. The Veterinary Department selected erd in what they regarded as a clean area at Belmont, near nberley, but on going there Dr. Edington discovered that cattle on the adjoining farm were badly affected with lerpest, and there is reason to believe that from this source selected herd had been already infected. In the selected herd e were 128 head of cattle, and of these 126 were injected h glycerinated bile supplied by Dr. Edington, two being uninjected for a control experiment. On revisiting the n ten days later Dr. Edington ascertained that one of the cted animals, certainly infected prior to the injection, had wn symptoms of rinderpest and had died. Of the remaining protected animals 115 were then injected by Dr. Edington the Colonial veterinary surgeon with virulent blood, which at the same time and in the same dose injected into the unprotected animals. Ten of the protected animals were ded over to Dr. Kolle, private assistant to Dr. Koch, who been sent by the Health Department of the Colony to watch the experiment, and were injected by him with blood of exceptional virulence, which he had brought with him. Of the 125 protected animals, two suffered from a slight attack of rinderpest but recovered, while all the others remained quite healthy, whereas the two unprotected animals died of rinderpest on the twelfth day, and within fifteen minutes of each other.

Since this experiment Dr. Edington has practised his protective injection on several large herds, and always with satisfactory results, the highest mortality having been a little over 3 per cent., or eight animals in a herd of 234. This herd which belonged to Mr. Vermaak, an enterprising Dutch farmer, was made up of very valuable Friesland cattle, and included the cow which took the Queen of Holland's first prize. The French antitoxic serum method is, Dr. Edington believes, only useful in the case of infected herds. Thus when antitoxic serum is administered, an injection of virulent blood may be made the following day without any evil effect, but if the injection be repeated ten days later, or if the animal be then exposed to infection, rinderpest inevitably follows. The action of the antitoxic serum appears therefore to be on the microbes of the disease, which it kills without exciting any effect on the blood. But the action of the blood or bile which has lost its virulence, or of a mixture of both, which succeeds equally well, is on the animal body, which is either rendered tolerant or has its power of resistance increased. It is found that after inoculation with blood or bile, even in cases in which there has been little or no temperature reaction, the blood of the animal inoculated is virulent to unprotected animals as long as ten days. Dr. Edington's method of protection is now adopted in the Colony in preference to that of Dr. Koch, both because of its certainty and cheapness. By Koch's method green bile only can be used, and this requires the sacrifice of 10 per cent. of the cattle for its production, but by Dr. Edington's method almost all biles can be used. This, it is calculated, means a saving to the Colony of upwards of 300,000*l.*

[illegible] Although the use of yeast in the farmhouse is not [illegible] as it was some years since, yet there are probably many farmers who will be glad to know how to ensure that the small quantity which they do employ is of the best quality. The following simple methods of testing yeast are described by J. Goodfellow, Ph.D.:—

The chief tests to be employed are:

I. Microscopic examination.
II. For added starch.
III. Strength.

I.—MICROSCOPIC EXAMINATION.

Materials required:

1. A microscope with at least one-sixth objective. 2. A few glass slips. 3. Thin cover glasses. 4. A thin glass rod.

The examination is conducted as follows:—A small piece of yeast is mixed in a clean tumbler with a little cold water, and by means of the glass rod a drop is placed on the centre of the glass slip. One of the cover glasses is gently placed over the drop, and the slip removed to the stage of the microscope—which must be in a vertical position—and examined in a good white light. By this means the general character of the yeast cells can be ascertained, whether old or immature, and the freedom or otherwise from foreign ferments, like the lactic, and putrefying organisms.

It will be readily understood, however, that considerable experience is required before such an examination will yield definite information on these points. The best way is to examine a large number of yeasts of known purity and quality, and compare their appearance with bad yeasts.

Good yeast is indicated by:

1. *Uniform size of the yeast cells.*
2. *Freedom of cells (i.e. not in clusters or chains).*
3. *The cells should be well filled out and show minute spaces termed vacuoles.*
4. *Freedom from bacteria.*

The spaces between the isolated yeast cells should be fairly free from the moving specs and rod-like bodies which are the microbes.

If, on the other hand, the cells are in clusters or chains, and show great variations in size, or are mixed with a large number of bacteria, the yeast is not the best suited for baking purposes.

II.—TEST FOR ADDED STARCH.

Materials required:

1. A few test tubes. 2. A spirit lamp or Bunsen gas burner. 3. A funnel and filter paper. 4. Iodine solution.

The latter can be prepared by dissolving a little potassium iodide in water and adding crystals of iodine until the liquid is dark brown.

The test is carried out as follows:—A small piece of yeast is mixed with water and boiled over the spirit lamp. The hot liquid is filtered into a clean test-tube and cooled. A drop or two of the iodine solution is now added and the colour noted.

If the colour is brown, or only faintly blue, the yeast is free from added starch.

If, on the other hand, a distinct dark blue colour is obtained, starch has been added.

Starch can also be detected in the raw condition by the microscope. As starch has no fermenting power its addition lowers the strength of the yeast, so that all other things being equal, a pure yeast is stronger than one adulterated with starch.

A simpler way of performing the test is to simply boil the yeast and water, cool, and add iodine solution. If adulterated, a dark blue colour will be obtained.

III.—STRENGTH.

The strength of a yeast is usually taken to indicate the fermenting power when mixed with flour or other fermentable bodies, and bakers classify yeasts as weak or strong according to whether they take a long time to ripen the dough or otherwise. In other words, a weak yeast works slowly, while a strong yeast works rapidly.

Now, fermentation produces gas, and the strength of a yeast may be accurately determined by measuring the volume of gas given off in a given time. It is important to remember that the volume of gas given off varies with the substance used for the fermentation. If sugar be used, the gas is given off more rapidly than would be the case with flour, so that in all such tests the same formula for making up the fermenting mixture must be employed to secure reliable results.

Another very simple method of measuring the strength of yeast is to make a thin batter of yeast and flour, and place in a tall glass, and observe how far the sponge will rise.

Simple Method of ascertaining the Comparative Strength of two Yeasts.

Materials required:—

1. Two tall glass jars of 1,000 cubic centimetre capacity.
Flour. 3. Cane sugar.

Method.—Mix 1 oz. of the first yeast, 3 ozs. of strong flour, [illegible] cane sugar, with sufficient water to fill up one jar to [illegible] c.c. mark.

[illegible] precisely the same with the second yeast, using similar quantities of yeast, flour, and sugar, and sufficient water to fill [illegible] the jar to the 300 c.c. mark.

Place both jars in a warm place about 90° Fahr. Carefully [illegible] the height to which each mixture rises, and the time occupied. When the latter reaches its highest point, break up the frothy head by a pencil, and note the height of the second rising, and the time occupied.

The *best* yeast rises to the highest point in the quickest time.

A good quick working yeast should at least rise to 800 c.c. in three hours the first time.

Nitragin.—Mr. J. R. Campbell, in summarising the results of trials with nitragin, in a letter to the 'Agricultural Gazette,' says:—Nearly eighteen months have passed since Dr. Voelcker called the attention of agriculturists in this country to the fact that cultivations of bacteria were being offered for sale for the purpose of inoculating soil intended for leguminous crops. Dr. Voelcker's article in the Journal of the Royal Agricultural Society of England had the effect of stimulating a desire on the part of farmers and others to test the value of nitragin. There must now be ready a large number of results of trials with this material. The Glasgow Technical College conducted trials last season with nitragin for beans and red clover in the South-West of Scotland. The material was obtained direct from Germany. On two farms in Kirkcudbrightshire nitragin for beans was tested. The contents of the bottle were in each case mixed, according to directions, with some sandy soil, and then sown at the same time as the bean seed. In one case the beans and nitragin were sown broadcast on land ploughed out of grass. In the other case both were sown in rows and covered by the plough. No difference could be detected at any stage of growth on either farm between the inoculated and uninoculated land. It is curious to note that one of the farmers invariably dresses his bean crop with nitrate of soda, though well aware of the peculiarity of leguminous plants. He finds that the bean crop is improved by the nitrate of soda, and that it is a profitable practice. It would be interesting to know whether other bean growers use nitrate of soda for a similar purpose. Nitragin for red clover was also tried on the same two farms. It was applied to first year's clover-hay, the clover-seed having been sown the previous season. The results of these trials were also negative. On one farm in Dumfriesshire nitragin was sown with the clover-seed along with oats after roots. The farmer reports that "the clover on the half-acre treated seems healthier if anything, but the difference is not so marked that a person walking over the fields would observe it." A few small plots at Camphill grounds in Glasgow were also put under experiment with nitragin for red clover. The report to hand is that on the treated plot the plants seem more numerous than on the untreated plot.

At the Lancashire County Council Farm trials with nitragin for red clover, beans, and peas had been begun before I took charge of the work there. The plots were small—a few square feet. There was no apparent difference between the treated and untreated clover plots, but in the case of beans and peas there was a marked difference. The plants were more numerous and larger on the treated than on the untreated plots. Of six rows of peas five were treated and one not treated. The average of the produce of the five treated plots was 8⅓ per cent. greater than the produce on the untreated plot. In the case of beans the difference was still greater. There were three plots of beans, one untreated. The average increase of the two inoculated plots was 18¼ per cent. greater than the produce of the uninoculated plot. It is unfortunate that there was only one untreated plot in these trials. One cannot confidently say that the increase is due to the nitragin; the single uninoculated plots may have been unfortunate in a variety of ways. Still, it is highly probable that the increase was due to the inoculation. The negative results from the Scotch trials must also not be taken as proof that nitragin is valueless for the purpose for which it is sold. The beans were on good bean land, and the clover on good clover land. There was no evidence that the land selected was deficient in bacteria suited to beans or clover. All that may be said of these trials is that there appears to be no necessity for purchasing bacteria, as the land is sufficiently well stocked with these for bean and clover-growing. Land that won't grow these crops must be found and the nitragin tested there. Someone has, however, wisely remarked that land where leguminous plants won't thrive may also be land where the suitable bacterium won't live because of the soil being physically or chemically defective. If this be so our efforts will have to be directed to improving the soil, so that the proper bacteria may live and multiply in it, when, of course, there will be no need to purchase bacteria.

Milking Trials.—There is no more interesting or valuable work done by the British Dairy Farmer's Association than the minute testing of the milking powers of cows of various breeds which takes place at the Dairy Show.

The results there obtained enable one to form an idea of what the best dairy animals of each breed are capable of doing, and no farmer can study these results without recognising the vast improvement which it is yet possible to make in the ordinary dairy cows of the country. The following tables show the amount and quality of the milk yielded by the prize-winning cows :—

Class and Variety	Class 1.—Shorthorns.						Class 2.—Jerseys.					
Name of animal	Profit.		Marjorie.		Gaiety.		Madeira 5th.		Lavanga.		Golden Chance.	
Name of owner	Mr. John Evans.		Mr. Charles Birdsey.		Mr. J. F. Spencer.		Mr. H. Howard Vyse.		Dr. Herbert Watney.		Mr. W. McKenzie Bradley.	
Age	6 yrs.		7 yrs.		6 yrs.		—		—		—	
Last calved	Sept. 22.		Oct. 2.		Sept. 25.		—		—		—	
Days since calving	27		17		24		—		—		—	
	Morn.	Even.	Morn.	Even.	Morn.	Even.	Morn.	Even.	Morn.	Even.	Morn.	Even.
Weight of milk—first day ..	33·1	31·8	36·0	31·5	27·0	26·3	24·5	22·2	24·8	22·7	19·0	19·7
" " —second day ..	35·6	35·6	36·6	32·4	26·8	26·0	26·3	24·3	24·5	20·8	20·0	18·0
Average	34·3	33·7	36·3	31·9	26·9	26·1	25·5	23·2	24·6	21·7	19·5	18·8
Percentage composition of the milk — Fat	3·39	4·37	3·49	3·73	5·33	5·57	5·73	6·05	4·60	6·81	4·27	5·96
Percentage composition of the milk — Other solids ..	8·37	7·99	8·83	8·51	8·73	8·71	9·23	9·97	8·98	8·77	9·27	9·06
Percentage composition of the milk — Totals	11·76	12·36	12·32	12·24	14·06	14·28	14·96	16·02	13·58	15·58	13·54	15·02
Total weight of fat .. lbs.	1·16	1·48	1·26	1·19	1·43	1·46	1·46	1·40	1·13	1·48	·83	1·12
Calculation of points (multiply by 20)	2·32	2·96	25·2	23·8	28·6	29·2	29·2	28·0	22·6	29·6	16·6	22·4
Total weight of other solids .. .. .. lbs.	2·87	2·63	3·20	2·72	2·35	2·28	2·34	2·27	2·21	1·90	1·80	1·71
Calculation of points (multiply by 4)	11·48	10·52	12·8	10·88	9·40	9·12	9·36	9·08	8·84	7·6	7·2	6·84
Points. For time since calving	0·7		—		0·4		1·8		1·8		18·0	
Points. For weight of milk	68·0		68·2		53·0		48·7		46·3		38·3	
Points. For weight of fat	52·8		49·0		57·8		57·2		52·2		39·0	
Points. For weight of other solids ..	22·0		23·7		18·5		18·4		16·4		14·0	
Total	143·5		140·9		129·7		126·1		116·7		109·3	
Awards	1st, Medal, and Challenge Cup.		2nd Prize.		3rd Prize.		1st Prize, Lord Mayor's Cup.		2nd Prize.		3rd Prize.	

MILKING TESTS—*continued.*

	CLASS 3.—GUERNSEYS.						CLASS 4.—RED POLLS.				CLASS 5. AYRSHIRES.	
Name of animal	Norman's Lass.		Golden Cloud.		Richesse du Chene 2nd.		Russett 2nd.		Faith.		Jess.	
Name of owner	Mr. E. A. Hambro.		Mr. Jas. S. Motion.		Mr. E. A. Hambro.		Mr. William E. Long.		Lord Rothschild.		Mr. Albert Merry.	
Age	7 yrs.		9 yrs.		7 yrs.		9 yrs.		10 yrs.		7 yrs.	
Last calved	Sept. 20.		Aug. 18.		April 28.		Sept. 7.		Oct. 1.		Sept. 26.	
Days since calving	29		62		174		42		18		23	
	Morn.	Even.	Morn.	Even.	Morn.	Even.	Morn.	Even.	Morn.	Even.	Morn.	Even.
Weight of milk—first day.. ..	25·6	22·3	23·5	19·3	12·5	12·8	30·3	29·2	31·0	25·7	28·5	25·3
" " —second day ..	27·2	22·2	22·0	18·0	16·4	12·7	35·3	31·8	35·0	21·8	28·2	26·5
Average	26·4	22·2	22·7	18·6	14·4	12·7	32·8	30·5	33·0	23·7	28·3	25·9
Percentage composition of the milk: Fat	3·94	5·31	4·02	5·01	6·00	6·26	2·73	3·83	2·47	3·50	4·22	4·74
Other solids ..	8·95	8·77	8·82	8·71	9·21	9·24	8·91	8·83	8·85	8·76	9·46	9·16
Totals	12·90	14·08	12·84	13·72	15·30	15·50	11·64	12·66	11·32	12·26	13·68	13·90
Total weight of fat .. lbs.	1·05	1·20	0·91	0·93	0·98	0·79	0·89	1·17	0·81	0·83	1·20	1·23
Calculation of points (multiply by 20)	21·0	24·0	18·2	18·6	17·6	15·8	17·8	23·4	16·2	16·6	24·0	24·6
Total weight of other solids .. .. .. lbs.	2·37	1·99	2·00	1·62	1·33	1·17	2·92	2·70	2·9	2·08	2·42	2·48
Calculation of points (multiply by 4)	9·48	7·96	8·0	6·48	5·32	4·68	11·68	10·8	11·6	8·32	9·68	9·92
Points: For time since calving	0·9		4·2		15·4		2·2		0·0		·3	
For weight of milk	48·6		41·3		27·1		63·3		56·7		54·2	
For weight of fat	45·0		36·8		33·4		41·2		32·8		48·6	
For weight of other solids ..	17·4		14·5		10·0		22·5		19·9		19·6	
Total	111·9		96·8		85·9		129·2—10=119·2		109·4—10=99·4		122·7	
Awards	1st Prize, Lord Mayor's Cup.		2nd Prize.		3rd Prize.		1st Prize.		2nd Prize.		1st Prize.	

CLASS AND VARIETY	CLASS 5.—AYRSHIRES—*contd.*		CLASS 6.—KERRIES AND DEXTERS.						CLASS 7.—CROSSES.			
Name of animal	Primrose.		Kildare.		Eyvind 3rd.		Bounce.		Nancy.		Magpie.	
Name of owner	Mr. John Holm.		Express Dairy Company, Ltd.		Express Dairy Company, Ltd.		The Duchess of Newcastle.		Mr. George Long.		Mr. Albert Merry.	
Age	—		9 yrs.		7 y. 10 m.		5 yr. 7 m.		5 y. 9 m.		8 y.	
Last calved	Sept. 17.		June 14.		April 23.		Sept. 29.		August 30.		October 4.	
Days since calving	32		127		179		20		50		15	
	Morn.	Even.	Morn.	Even.	Morn.	Even.	Morn.	Even.	Morn.	Even.	Morn.	Even.
Weight of milk—first day ..	29·2	27.5	19·0	14·0	17·4	13·3	19·5	18·3	30·0	31·3	35·8	34·2
„ „ —second day ..	26·8	29·5	17·5	15·7	15·2	12·5	20·0	17·4	32·8	26·5	38·3	34·9
„ Average	28·0	28 5	18·2	14·8	16·3	12·9	19·7	17·8	31·4	28·9	37·0	34·5
Percentage composition of the milk—Fat	3·09	4·23	5·29	5·59	4·99	5·94	3·94	4·57	3·29	4·89	2·94	3·32
Percentage composition of the milk—Other solids ..	8·65	8·53	8·37	8·29	9·31	8·90	9·10	8·85	8·97	9·09	8·90	8·68
Percentage composition of the milk .. ..—Totals	11·74	12·76	13·66	13·88	14·30	14·84	13·04	13·42	12·26	13·98	11·84	12·00
Total weight of fat .. lbs.	·86	1·21	·96	·82	·81	·76	·77	·81	1·03	1·42	1·09	1·15
Calculation of points (multiply by 20)	17·2	24·2	19·2	16·4	16·2	15·2	15·4	16·2	20·6	28·4	21·8	23·0
Total weight of other solids .. .. .. lbs.	2·41	2·43	1·52	1·22	1·52	1·15	1·79	1·56	2·82	2·62	3·30	3·0
Calculation of points (multiply by 4)	9·64	9·72	6·08	4·88	6·08	4·60	7·16	6·24	11·28	10·48	13·2	12·0
Points—For time since calving ..	1·2		10·7		15·9		—		3·0		—	
Points—For weight of milk	56·5		33·0		29·2		37·6		60·3		71·5	
Points—For weight of fat	41·4		35·6		31·4		31·6		49·0		44·8	
Points—For weight of other solids ..	19·3		10·9		10·7		13·4		21·7		25·2	
Total	118·4		90·2		87·2		82·5		134·0		141·5−10=131·5	
Awards	2nd Prize.		1st Prize.		2nd Prize.		3rd Prize.		1st Prize, L.M. Cup.		2nd Prize.	

MILKING TESTS—*continued.*

CLASS AND VARIETY	CLASS 7.— CROSSES—*contd.*		CLASSES 8 AND 9.—JERSEY HEIFERS.				CLASS 16.—GOATS.			
Name of animal	Lady Fragrant.		Winks.		Ida 2nd.		Golden Queen.		Ginney.	
Name of owner	Mr. Chas. Birdsey.		Mr. W. J. Alexander.		Mr. William Alexander.		Mr. J. W. Pollitt.		Mr. John George Dawson.	
Age	5 y. 6 m.		1 y. 10 m. 3 w.		2 y. 4 m. 1 w.		—		—	
Last calved	September 2.		September 26.		September 14.		—		—	
Days since calving	47		23.		35		—		—	
	Morn.	Even.	Morn.	Even.	Morn.	Even.	Morn.	Even.	Morn.	Even.
Weight of milk—first day	25·5	20·8	17·7	12·9	10·6	11·4	3·4	2·0	2·6	1·8
„ „ —second day	24·0	22·7	14·8	14·0	11·3	10·7	3·0	2·3	2·0	1·6
Average	24·7	21·7	16·2	13·4	10·9	11·0	3·2	2·1	2·3	1·7
Percentage composition of the milk — Fat	5·74	6·07	5·51	7·35	6·30	7·57	7·05	8·09	8·82	8·50
Percentage composition of the milk — Other solids	8·76	8·41	8·87	8·53	9·22	8.47	9·05	9·05	9·40	9·34
Percentage composition of the milk — Totals	14·50	14·48	14·68	15·88	15·52	16·04	16·10	17 14	18·22	17·84
Total weight of fat .. .. lbs.	1·42	1·32	·94	·98	·69	·83	·22	·17	·20	·14
Calculation of points (multiply by 20)	28·4	26·4	18·8	19 6	13·8	16·6	4·4	3·4	4·0	2·8
Total weight of other solids lbs.	2·16	1·83	1·43	1·14	1·0	·93	·30	·19	·21	·16
Calculation of points (multiply by 4)	8·64	7·32	5·72	4·56	4·0	3·7	1·2	·76	·84	·64
Points — For time since calving	2·7		·3		1·5		·0		2·0	
Points — For weight of milk	46·4		29·6		21·9		5·3		4·0	
Points — For weight of fat	54·8		38·4		30·4		7·8		6·8	
Points — For weight of other solids	15·9		10·3		7·7		1·9		1·5	

Calved under 100 days.

					lbs.	oz.	lbs.	oz.			
Rosea	Capt. the Hon. T. S. Brand	June 10, '93	Sept. 20	30	33	12	1	10¼	20·57	Fair.	
Sabina	Dr. H. Watney	Apr. 9, '85	Aug. 16	65	39	4	1	14½	20·59	Excellent.	3rd Prize.
Belle Marie ..	Miss Moore	Apr. 2, '91	Sept. 2	48	36	15	1	14	19·70	Good.	
Frivolity	E. Carter	Mar. 10, '90	Aug. 30	51	41	8	1	12½	23·29	Excellent.	
Lavanja	Dr. H. Watney	May 5, '91	Sept. 11	39	47	8	2	10½	17·88	Good.	1st Prize.
Good Old Mother	D. Mutton	May 23, '89	Sept. 25	25	36	12	2	0	18·37	Excellent.	2nd Prize.
Pebble 2nd ..	D. Mutton	Feb. 15, '90	July 24	88	27	0	1	3½	22·10	Good.	
Lilian	C. Birdsey	—	—	—	35	4	1	10¾	21·08	Poor.	

Calved 100 days or over.

Rose of Sharon	Capt. the Hon. T. S. Brand	Dec. 18, '93	May 24	149	28	12	1	5¼	21·64	Excellent.	
Finish	E. Carter	Feb. 9, '86	Apr. 17	186	31	15	1	10¾	19·10	Fair ..	Jersey Society's Bronze Medal,
Opale	Dr. H. Watney	June 16, '91	June 29	113	33	7	1	10½	20·18	Excellent.	
Lady Lavinia 5th	W. McKenzie Bradley ..	Dec. 26, '89	Apr. 26	177	38	12	1	12	22·14	Fair ..	Jersey Society's Silver Medal.
Golden Chance	W. McKenzie Bradley ..	Aug. 12, '92	Jan. 6	287	38	12	1	6¾	27·25	Fair.	
Tuddie's Queen	W. McKenzie Bradley ..	Apr. 24, '93	June 12	130	31	12	1	12¼	17·98	Fair ..	Jersey Society's Gold Medal.

Shorthorn Butter Test.

		Age. y.	m.	d.									
Nellie	Welford's Surrey Dairies..	6	0	0	Sept. 28	22	46	8	1	10¾	27·81	Fair.	
Primrose	Welford's Surrey Dairies..	6	0	0	Sept. 29	21	30	4	1	9	19·36	Poor.	
Jessamine ..	C. Showell	3	2	29	July 7	105	39	8	1	5¾	29·05	Fair.	
Profit	J. Evens	6	0	0	Sept. 22	28	64	15	2	9¾	24·88	Good.	2nd Prize.
Gaiety	J. F. Spencer	6	0	0	Sept. 25	25	53	5	2	11¾	19·49	Excellent.	1st Prize.
Mayblossom ..	C. Birdsey	6	0	0	Sept. 12	38	58	5	1	2¾	49·76	Poor.	
Marjorie	C. Birdsey	7	0	0	—	—	67	8	2	4½	29·79	Fair.	

BUTTER TEST FOR ANY OTHER BREED OR CROSS.

PRIZES.—A Silver Medal to the Best of each Breed or Cross if considered worthy by the Judges.

Name of Cow.	Breed.	Exhibitor.	Age.			Date of last Calf.	Number of days in Milk.	Milk Yield.		Butter Yield.		Ratio, viz.: lbs Milk to 1 lb. Butter.	Awards.
			y.	m.	d.	1897		lbs.	ozs.	lbs.	ozs.		
Fan 11th	Guernsey	J. D. Toogood Parsons..	5	7	7	May 27	146	19	7	0	11½	13·52	
Golden Cloud	Guernsey	J. S. Motion	9	9	0	Aug. 18	63	42	13	1	15	22·09	Silver Medal.
Russett 2nd	Red Poll	W. E. Long	9	6	14	Sept. 7	43	59	8	1	10¾	35·58	
Tamer..	Red Poll	A. J. Smith	5	9	0	Aug. 25	56	35	10	1	2¾	30·40	
Ashlyns Sybil	Red Poll	Lord Rothschild	7	4	16	Aug. 23	58	53	5	1	3½	43·74	
Gal 2nd	Red Poll	Lord Rothschild	7	4	10	Aug. 14	67	44	4	1	1½	40·45	
Faith	Red Poll	Lord Rothschild	10	7	18	—	—	56	12	1	7	39·47	
Miss Poppy	Red Poll	J. E. Platt	7	4	7	Sept. 3	47	32	12	1	0	32·75	
Elmham Rosebud 9th	Red Poll	J. E. Platt	6	5	21	June 4	138	25	0	0	12¾	31·37	
Highland Belle.. ..	Ayrshire	C. Birdsey	5	6	0	Sept. 8	42	45	0	1	12½	25·26	
Magpie	Dutch	Welford's Surrey Dairies	6	0	0	Sept. 9	41	25	5	1	2¼	22·19	
Lady Fragrant	Cross-bred	C. Birdsey	5	6	0	Sept. 2	48	46	5	2	13½	16·28	Silver Medal.
Nancy..	Cross-bred	G. Long	5	9	21	Aug. 30	51	61	5	2	3¾	27·44	
Swissville Royal 2nd	Guernsey	J. D. Toogood Parsons..	2	11	21	Sept. 20	30	30	10	1	10¼	18·66	
Grace..	Cross-bred	J. Holm	2	6	0	—	—	28	8	0	15½	29·41	
Primrose	Ayrshire	J. Holm	—			—	—	56	5	1	15½	28·60	
Douglass	Ayrshire	J. Holm	7	0	0	—	—	53	1	2	0½	26·14	Silver Medal.
Waterend Beauty ..	Cross-bred	J. Holm	6	0	0	—	—	39	11	1	1¾	35·77	

Butter Tests.—The preceding tables (pages 209 and 210), show the amount of Butter which was yielded in one day by cows of various breeds shown at the Dairy Show in October, 1897.

Fattening Turkeys.—Mr. Edward Brown, F.L.S., in a recent contribution to the 'Agricultural Gazette,' says:—Some of the French turkeys which have been placed upon our markets during the last few years have been very close rivals of the home-fed birds, and I am not sure whether they have not been better in one respect, namely, the perfect way in which they are fatted. During visits to Normandy, I have been surprised at the attention paid to our markets by farmers and dealers there, who ay themselves out to supply our needs, and strive to meet the market demands, which our own people too often ignore. I want, therefore, to utter this note of warning, in order that there may be a constant striving towards improvement, even n turkeys, where we have been so pre-eminent; for unless this is the spirit shown the ground will be cut out under our feet.

Last December at the Smithfield Table Poultry Show one of the French visitors gave expression to the statement that we produce some of the finest fowls to be seen anywhere, but do not know how to finish them properly. This is true. What we want to do is to seek for methods of feeding our birds so that they will kill well, and dress in the best manner possible.

For fattening turkeys it is necessary to have sweet meals of the best kind, either ground oats, buckwheat meal, or fine barley meal. This latter is sometimes mixed with wheat meal coarsely ground, and so long as the two are mixed they make an excellent food, but wheat meal should never be given alone. The meal should be prepared into a friable paste by means of soured skim milk, and in very cold weather it is better if warmed. Another good plan is to cook potatoes and mix these with the meal and milk. It will be seen that soured skim milk is recommended. Some feeders use the milk sweet, but t will be found to give better results when soured as in the ase of chickens, and during the last two or three weeks half an ounce of fat for each bird may be added to the mixture, which should be fed from troughs, and any left after the birds re satisfied should be removed. This can be given to the owls.

As a rule in this country the afternoon meal consists of whole barley, oats, or even maize, but it is better to give soft ood, as described above, both morning and afternoon. Should he whole grain be employed—and for this purpose oats are he best, with buckwheat or barley second best (maize giving bjectionable yellow fat)—it should be steeped in hot water or steamed until quite soft. Under no circumstances should grain be given in the raw state, for as the birds have no exercise during fatting, they do not digest hard grain so easily as soft food. Provided that the birds are fed in this manner twice a day at regular times, they ought to put on, with that evenness which is so desirable, flesh of a good colour. The effect of feeding on milk is to whiten the flesh, and this is what we want to secure—specimens which at once please the eye and the palate. In some parts of France they frequently give chesnuts or ordinary nuts to turkeys. The same results can be obtained by adding a little pea or bean meal to the soft food, but if this be given too freely a hardening of the flesh results, which is most undesirable.

During the time the turkeys are undergoing the process of fatting they lay on flesh better if kept in large sheds, which should be closed all round, but simply wire-netted in front, as they must be protected and yet have plenty of fresh air. This shed should have perches 3 inches broad, and not more than 3 feet above the ground, which can be removed in the day time. It must be kept clean, and fresh straw should be laid down as often as necessary. No overcrowding must be allowed, and at least ten square feet of floor-space given to each bird. A heap of coarse grit and sand, which is all the better if mixed with slaked lime or old mortar, must be provided. Cramming turkeys, either by pellets or with machines, as a rule is scarcely necessary, for they lay on flesh rapidly in the ordinary manner.

Cutting a Fence.—A neat farmer is easily distinguished by his neat fences; but the artistic hedge cutter is rapidly becoming extinct. There are plenty of hedge spoilers, but very few hedge menders. The average labourer, when laying a hedge, either takes too much out or leaves too much in, both of which faults are equally bad, for if you take too much out you make the fence too weak, and if you leave too much in you smother the shoots, and prevent the young wood from growing up, and so making new material for future laying. There is a wide difference between cutting a hedge and making a fence, though they are often looked upon as being synonymous terms. The primary use of a fence is to make a division between fields and keep the stock within bounds, and so prevent them straying where they are not intended to go. For this purpose a fence should be sufficiently strong without taking up more room than is absolutely necessary. A fence that is too wide covers a larger quantity of ground than is necessary, ground which should be used for some other purpose; so that a fence too wide is a distinct loss to the farmer. A strong fence 2 feet wide is far preferable to a straggling hedge 2 yards wide, which is perhaps no fence at all. In exposed situations the fence should be allowed to grow sufficiently tall to afford shelter in summer from the heat of the sun and in winter from the cold and biting wind. Round the arable fields the smaller the fences are the better, as there the sun is required to shine on the field equally in every part, so that the grain may ripen all at the same time; besides, small fences afford less shelter for the birds and other vermin which prey upon the crops.

Real art is needed in making a fence when a hedge has been allowed to grow anyhow for several years, and is composed chiefly of old stumps, as thick as a man's leg, of various kinds of trees—thorn, hazel, ash, &c. A good fencer sees at a glance which to cut out and which to leave in, but this perfection in the art of hedging can only be acquired by long practice.

It is better to have a fence tied to the stakes, not merely the thorns twisted in and out. For the tying some men use willow twigs, while others prefer pitch cord, the former is the cheaper, but the latter the more durable. In cutting a thorn every stroke of the axe or hook should be made upwards; cutting downwards will ruin any fence, as it "shatters" the stem, and so prevents its shooting out by causing it to decay downwards till it comes to the sound (*i.e.* unshattered) wood, whereas the part cut upwards shoots at once from the "cut," and makes a much stronger and healthier growth, besides shooting quicker. This cutting upwards is a matter of the greatest importance.

Why is it that so few young men are of any use at a hedge? The reason is that they will not take the necessary pains over it. They are always in too great a hurry, and anxious to get it finished and go to something else. It is surprising to see some old men at a hedge. One wonders how they have the strength to cut and lay the thick wood. But it is not all strength. There is a great deal in knowing exactly how and where to cut, so that the fence can easily be laid in its proper position, without the risk of its breaking off short.

Some men fasten a willow rod along the top of the fence when they have laid it. This adds to the appearance, but does not add to the stability of the work, if the stakes are firmly driven into the ground, and the thorns well twisted between them. It also adds to the cost of laying a fence, as it takes more time. The best wood for stakes is undoubtedly oak. Split the stakes from a straight piece of the tree. After oak comes fir—larch for choice; and the worst of all is ash, which in the ground will very soon decay. The best plan of all is: if there are sufficient thorns standing straight up, leave some for line stakes, havi cut them off the level you wish to make your fence; these will grow well after being cut off, and will be much stronger than any stakes you can put in; they will grow and thicken the hedge as well as support it, thus doing double duty. This method is only applicable when you have sufficient thorns to spare. When a thorn is nicked and laid in its proper place some people put a piece of clay or turf over the place where it is nicked —as they say, to keep it cool and to help it shoot. But others think it acts in the reverse way, causing the stump to decay, owing to the moisture collected in the clay or turf by rain. The stump should shoot out again as soon as possible, and anything that will encourage this is advantageous. Put no more dead wood into the fence than is absolutely necessary (by dead wood I mean thorns which have been cut off), as the dead wood decays very soon, and leaves a weak spot.

Winter is *the* time to lay hedges, but, in case the thorns are old and thick, the later in the spring the work is done the better, as there is not so long to wait for the sap to rise, and less likelihood of the thorns dying. Never lay a fence during severe frost, the wood is then so brittle that it will break off rather than be bent in its proper position after being nicked. It is always safe to leave it till there is a thaw. Work of this kind cannot be done hurriedly, and it is always cheapest to set a good, trustworthy man at day work; he can then do it carefully, and not be thinking he has to do so many yards to make his wages. It is always most satisfactory to get this kind of work well done, and it is cheapest in the end, the work being more durable.

Poultry. How to distinguish.—Mr. Edward Brown, F.L.S., writing to the 'Agricultural Gazette,' says:—When it is recommended that fowls should be killed off soon after they have completed their second year, which means that half the stock should be renewed every year, the question is frequently asked, "How can we mark the birds so that they may be easily distinguished?" When only a few birds are kept, so that each one is individually known, this is not at all difficult, but with a large flock it is scarcely possible to discriminate in the same way, and some system is desirable by which the age of each hen is easily fixed.

I think that the ring system is to be preferred. Various forms of rings can be used. Round indiarubber rings, similar to those sometimes used for umbrellas, answer very well. They must not be tight, or they would do injury to the leg, nor must they be too large, or the birds will pull them off. If of the proper size no harm can be done, and they are easily seen.

Rings made of either copper or soft flexible metal are better. Both these are now offered for sale. The former are rings of copper wire, perfectly round, and bending quite easily, so that they can be slipped on to the leg when opened sideways, and the ring closed on, when it cannot be got off, and yet if of the right size does not interfere with the bird's comfort in any way. Attached to the wire is a small brass numbered tag, so that any special bird can be picked out if a register of breeding is kept. The ordinary poultry-keeper does not do this, though it would be worth his while to keep in mind how his pullets are bred.

The other form consists of a narrow, flat band of soft metal, which can be fastened around the leg by means of a cut or notch. As there is no expansion possible when once it has been locked, it is essential to have the band of the right size. These are also numbered. The weight is little, and the rings do not incommode the wearers at all. They have a decided advantage over the indiarubber rings in that once on they cannot be pulled off by the birds. The best time for fixing them is when pullets are from about five to six months old, that is when they can be distinguished from the hens. Earlier than this is needless, unless a breeding record is to be kept, in which case it will be better to put them on before the pullets are mixed with others. Then it would be wise to have two sets, one smaller for the chickens, to be replaced by larger ones as soon as the leg has grown sufficiently to need the change.

The advantage of ringing the birds far more than compensates for the trouble involved, which latter is very slight. It is an essential part of the scheme that only the right or left leg shall be ringed in any one year, otherwise we should have to be dependent upon numbering, which is undesirable where large quantities are kept. Let us suppose that all the pullets hatched this year are ringed on the right leg. Next year ringing will be on the left leg. In the early summer of 1899 we know that all hens wearing a ring on the right leg are over two years old, and consequently have fulfilled their purpose in egg production. They should be got rid of, either by selling, or, after fattening, should be killed. The rings can be removed, and as a rule will be quite good enough for using again. When the time comes for the pullets of that year to be ringed, it will be on the right leg. The following year fowls with a ring on the left leg will be disposed of, and so on. It would be equally satisfactory if rings were used each alternate year, but probably most people will prefer to use them every season. I should advise that a record be kept as to the legs which are so marked, for it is quite possible that memory might in some instances be at fault.

To prevent any injury to the birds it will be a good plan to examine each one about a fortnight after they have been ringed, for sometimes fowls of the same breed vary considerably in the thickness of shank bone, and it is better to be on the safe side, even when there is no indication of lameness. Should at any time a bird be seen to hold up its leg as if in pain, or walk in a limping fashion, it should be looked to at once, otherwise permanent injury may result.

Keeping Apples.—In order to keep well, apples must be picked at the proper time, writes Professor J. Troop, in the 'American Agriculturist.' Care must be exercised in handling to prevent bruises, carefully assorting the ripe from the unripe, the perfect from the imperfect, and storing in a cool, dry place, with plenty of pure air free from all odours of decaying vegetables or other substances. The average fruit-grower does not exercise enough caution in handling and assorting his fruit.

The degree of maturity will have much to do with the keeping qualities. A late fall or winter apple should be mature, but not ripe, when it is picked, if it is expected to be kept for any considerable time. The process of ripening is only the first stage of decay, and if this is allowed to continue before picking, till the apple is ripe, or mellow, this breaking down process has proceeded so far that it is a difficult matter to arrest it. As soon, therefore, as the stem will separate freely from its union with the branch, the apple is sufficiently mature for storing.

The proper temperature for keeping apples is as nearly 35° Fahr. as it is possible to obtain, and in order to maintain this, it will often be necessary to provide a separate place for storing the fruit, as the average cellar under the dwelling house is wholly unfit for this purpose. If the cellar consists of several compartments, so that one can be shut off completely from the others and the temperature in this kept below 40°, it will answer the purpose very well.

Asparagus Rust.—For the last few years the asparagus growers in Worcestershire have been troubled with the asparagus rust, which has much reduced their crops. Mr. J. B. Carruthers, writing to the 'Agricultural Gazette,' has drawn attention to the fact that the disease has recently increased very rapidly, and it is of the greatest importance that steps should be taken to prevent, if possible, its spreading still more.

He says: The fungus causing this disease is a true "rust," belonging to the same group as the wheat rust, but unlike that ungus, one stage of which grows on the barberry, all the three tages of its life are passed on the asparagus.

Like all other fungoid diseases, its increase is favoured by varm, damp weather, and so noticeable is this that the veather is often confused by the farmer with the disease it avours, and a warm, muggy day gets called a "blight."

In the earlier stages the disease appears in flat spots of n orange colour, changing later to small brown spots on the branches of the plant, and in its last stage, during the months of August and September, causes a blackening sometimes of ll the branches of the plant. The first two stages are not easily detected, and often escape observation, but the last is nearly always only too evident, as the plants, instead of having their usual yellow and green colour before dying down, look as if they had received a shower of soot. It is unfortunate that the pest is not noticed in its earlier stages, for it might then be prevented or at least minimised. In its last stage it produces what are technically called telentospores, which are the seeds of the fungus, and which hibernate in the dry remains of the plants, and are ready to attack new plants in the following spring, so that it is of the highest importance that these diseased, blackened parts should be cut off in the autumn and burnt to avoid the spreading of countless millions of spores the next spring.

As to remedial measures, spraying in the spring would no doubt tend to check the disease, and the best and safest of fungicides for this purpose seems to be a solution of copper sulphate; 1 lb. of the bluestone to 25 gallons of water should be enough, though the addition of 1 pint of ammonia would add to the efficacy of the liquid.

But the asparagus grower should keep constant watch to detect the earlier stages of the disease and stamp it out, for if he takes no steps until the black, telentospore stage is observed, it is too late to prevent the effect of the ravages of the fungus. This will be clearly apparent in the reduced crop the following year, for so much nutrition has been taken up by the parasite that the store of food laid up to help in forming the buds next year is greatly reduced, and consequently a meagre crop is the result.

As asparagus is chiefly grown in contiguous districts in Worcestershire and Northamptonshire, the spreading of this disease is greatly facilitated, for the spores do not have to travel over any distance before they alight on a fresh victim. It is therefore all the more imperative that growers of asparagus should take every means in their power to prevent the increase of a disease which most seriously interferes with the profitable cultivation of this valuable vegetable.

German Forestry.—The following description of German forestry, as carried out in the Harz Mountain Forests, which treatment may be said to be typical of German methods of forestry management, is given by Mr. J. J. Simpson, in the 'Scottish Farmer.'

We alighted at the small railway station of Lautenberg, a picturesque village lying at the mouth of one of the Harz valleys. The next morning we drove on and into the forest.

In answer to a query as to who was responsible for the up-keep of the excellent road we were upon, the surface of which was certainly superior to that of many of our highways, we were told that they are kept up by the forest authorities, and are specially and carefully engineered, so that the gradients are nowhere excessive, and allow of timber being removed as easily as possible.

The forest here consists entirely of beech. From each side of the road rise the sides of the valley, densely clad with timber. To the eye uneducated to German forestry methods, one has almost to look twice to make sure it is beech, the remarkable density, straightness of stem, and freedom from big limbs are so utterly strange and novel to the British forester. Here are beech from fifty to sixty years of age, from 40 to 50 feet high, growing from 3 to 6 feet apart. We stand and admire the beautiful regularity of their growth, both in height and thickness of stem. How beech is grown here may be briefly related as follows:—All the beech one sees is grown by natural regeneration from seed. When the time for the regeneration comes, just before the end of the rotation, and before the ultimate crop of trees presently on the ground is removed, what is known as the first seeding cutting takes place; that is, the wood is thinned so that considerable breaks are made in the leaf canopy, which canopy, up to now, has been strictly preserved intact in order to protect the vegetable matter and humus on the surface of the ground from the wasting influences of the light, rain, &c., and to keep down surface vegetation. Now, when they wish for vegetation in the shape of young beech they open the canopy, admit the light, and wait for the full mast of the beech, which occurs about once every ten years. This seeding area, as it is called, is sown from the older trees for a period extending from twenty to twenty-six years, according to the success of the sowing and to the crops of seed borne by the parent trees. When the ground is sufficiently sown, the old trees are entirely removed, and the young beech (as we were shown later) is by this time, on a fair soil, growing up as thick almost as heather. In this state they are left to grow until about forty years old, when they are thinned for the first time.

Seeing one of these beech woods when about twenty years of age, one is confronted by a dense impenetrable thicket of young beech, in which the law of the survival of the fittest is slowly and surely at work, preparing, as it were, for the first thinning by suppressing the weaklings and leaving only the strongest and healthy specimens to be considered by the forester when he thinks artificial aid may be given. This first thinning, more appropriately termed in Germany "a cleaning," consists in cleaning out all the dead and suppressed trees and others, until there is left upon the ground a regular crop of young beech, standing from 3 to 4 feet apart, with (young as they are) clean stems and a tuft of branches at the top. This policy of density, which is so vital in the production of clean stems, is pursued until the main height growth is attained, when heavier thinnings take place in order that diameter growth may be obtained and the trees may the more rapidly attain timber-like dimensions.

Higher up the valley ere long the beech gives way to spruce and Scotch fir, which here are to be seen in every stage of growth, from those newly planted, about 4 feet asunder, those thinned for the first time (about twenty-five years old), and so on until we reach the edge of a clear cutting, where a compartment of spruce, having reached the end of its rotation, which is about 120 years, is being cleared off the ground. There are trees in the last stages of their growth, 100 to 140 feet high, clear of branches for 70 or 80 feet up, and with trunks as straight as gun barrels —truly a pleasant sight for any forester to look upon. The cutting was being carried out against the direction of the prevailing wind, i.e. in a westerly direction, so as to lessen the liability to wind-breaks. We stand and admire this final aspect of the German methods of timber cultivation, and can only admit that we have nothing like this kind of forestry in our own country, and that our results cannot be for a moment compared to the magnificent crop of timber before us.

Spruce are raised either from seed or by planting. Bunch planting is carried out in some localities where, to insure sufficient density, two or three are planted in every hole, one of which usually comes away. This method is only, however, resorted to in certain circumstances, such as in the case of a poor soil or an exposed situation.

One feature is constantly impressed upon us—*density*. In that word lies practically the whole of German forestry methods and their great difference from our British methods. In that word lies also the secret of the production of all that foreign timber which has ousted ours from the market.

Everybody who has seen a German forest must own that our methods are not only erroneous but show great ignorance of the natural laws which should govern the growth of a timber forest. One indeed wonders what we have been doing all these years with our eyes. It is very strange that these methods for generations have been in vogue at our very door, as it were, with uniform and complete success, and yet we have been pursuing methods diametrically opposite to them.

One other fundamental principle of the German methods is the strict preservation of the leaf canopy, the necessity for which does not appear to have struck the forester in this country. By its preservation a store of plant food is kept on hand in the shape of the decaying vegetable matter on the surface of the ground—such as results from fallen leaves, &c. No light is admitted by the close canopy overhead, and therefore nothing grows upon the floor of the forest to rob the soil at the expense of the trees, but everything goes for the one object—a crop of timber.

Profitable Sheep Farming.—In a paper which he recently read to the Driffield Farmers' Club, upon the above subject, Professor Wrightson compared the Wolds of Yorkshire with the Downs of Wiltshire, and found a considerable similarity between the districts. Both rested on chalk, both consisted of light land, and both were eminently sheep-farming districts. He therefore thought the practice of Wiltshire worthy of consideration by Yorkshire Wold farmers. He gave examples of the achievements of Wiltshire and Hampshire sheep-breeders in bringing out heavy lambs at an early age, and stated that this was not confined to ram breeders, but could be seen in the case of wether lambs. Ten lambs of his own, selected out of a large number, had arrived at the live weight of 112 lbs. in ninety-nine days after birth, so that, deducting birth weight, these lambs had actually increased in live weight, on an average. about 1 lb. per day. How was such a result obtained? No doubt it was partly due to the breed of sheep—the Improved Hampshire Downs—which possessed in an especial degree the gift of early maturity. He did not lay claim to absolute superiority in this respect, for he was aware that the records of the Smithfield Club showed that Hampshire lambs did not always head the list in the matter of average daily increase in weight from birth. However, during the first six months of existence the Hampshire Down sheep, in his opinion, excelled all other breeds in this respect, and in support of this contention he instanced the heavy carcase weight of Hampshire lambs slaughtered in June and July. Among other important causes of the excellent results obtained on the Hampshire and Wiltshire hill farms he laid stress upon the following:—(1) The use of ram lambs;

) the early lambing; (3) the system of catch-cropping, which
abled the farmers (4) to adopt a plan of constant change of
od; (5) liberal feeding with cake. He also pointed out the
lvantage of summer over winter cake-feeding.

He gave a detailed account of the Wiltshire system of catch-
opping, and showed how the succession of such crops enabled
ie shepherd to give a change of food at least every day. Thus
ie lambs would work between roots and green rye, and later
etween rye and water meadow, winter barley and trifolium,
ifolium and vetches, vetches and rape, rape and cabbage,
ibbage and turnips, until the period of the late summer fairs
rrived. In the height of the summer lambs would receive
iree changes of food in the day, as, for example, vetches, rape,
nd aftermath clover, or rape, cabbage, and clover. During the
ime period they would receive mangel cut into troughs and
arious descriptions of artificial foods, such as a mixture of
nseed cake, beans, malt, peas, and maize. Thus these lambs
iight be receiving eight or nine descriptions of food. He laid
ress upon the use of the lamb hurdle as an important institu-
on, by which lambs were able to run forward and crop the
ioicest food before the ewes, and thus obtain the advantage
open grazing and close folding at the same time.

The general opinion seemed to be that the soil and climate of
e Yorkshire Wolds were not adapted to the system of catch-
opping on account of the later harvest and the improbability
catch crops sown in later autumn being ready for con-
mption in time for a full crop of roots. The weight of the
ot crops, it was thought, would be lessened by a catch crop
tervening. But while for winter grazing the root crops ought
be grown to a maximum weight per acre, yet when summer
azing of lambs was the object, summer fodder crops became
greater importance than the succeeding root crop. Professor
rightson advocated the use of ram lambs in preference to
earlings. He admitted the difficulty of introducing catch-
opping into Yorkshire except to a partial extent, though
had seen a nice crop of turnips grown after vetches in
rthumberland, and instanced the growth of turnips after
ibble and after early potatoes as not unknown even in the
rth. He claimed importance for kale, and recommended it to
cultivated without singling out. He also advocated cabbage
ltivation, chiefly because the cabbage could be raised in seed-
d better than by sowing in the open field. This point was
portant because it enabled the farmer to be cleaning and
paring his land for cabbage, while at the same time the
ants were growing in the seed-bed. As soon as harvest
s completed this preparation could take place, and the

cabbage could then be planted out during autumn and early winter.

Epizootic Abortion.—The most important discovery bearing upon Agriculture made during the year 1897, was probably that by Professor Dr. Bang, of Copenhagen, relating to epizootic or contagious abortion. We will summarise from the Journal of 'Comparative Pathology and Therapeutics' Professor Bang's account of his researches.

In most civilised countries epizootic abortion of the cow appears to play a highly important *rôle*; indeed, in many regions it appears to be the disease which more than any other detracts from the profit of cattle breeding. It is therefore matter for surprise that the disease has, as yet, been to such a slight extent accurately investigated.

Although abortion may arise from various causes, yet, at the present day, the disease most frequently occurs under circumstances that compel us to assume the existence of an infectious agent.

As early as the beginning of the present century this view found expression in England. For example, in 'The Complete Farmer,' 5th edition, the following occurs: "It is considered certainly contagious, and when it happens the abortion should be immediately buried, and the cow kept as widely apart as possible from the herd, and not receive the bull that goes with them."

The layman had very early recognised the infectious nature of the disease, but the representative of science hesitated to adopt this view; and it was not till the beginning of the bacteriological era that the contagious nature of abortion again gradually came to be generally recognised.

The first, and as yet the only one, to submit the question to accurate investigation was Nocard, who, in December, 1885, was commissioned by the Minister for Agriculture in France to study the epizootic abortion which had for years prevailed among the excellent breeds of cattle in Nièvre. After having established the infectious nature of the disease on the basis of admirable clinical observations, Nocard discussed the various hypotheses which might be brought forward in explanation of the anatomical changes causing the abortion. He thought that he was able to make out from his investigations that epizootic abortion is brought about by a bacterial disease of the fœtus and its envelopes. But he did not succeed in obtaining decisive proof on this point—that is to say, cause pregnant cows to abort by inoculating them with one of the microbes which he had discovered. The main cause f Nocard's non-success was, that he did not possess an approriate nutritive medium wherein to grow the bacteria, as he did not add blood serum to the substances which he employed. Besides that, the material which he used for examination was not quite free from objection.

Professor Bang describes in detail how he set to work to investigate this disease, and the discovery of certain bacteria which he was led to look upon as the primary cause of the disease. The bacteria mostly had the appearance of cocci, but some of the free-lying individuals were of longer shape, and these were at first regarded as short oval structures; closer examination, however, under very high magnification, showed a very small bacillus, whose body contained one, two, or more rarely three, roundish or elongated granules. The length of the bacilli is very variable; the largest examples are about as long as tubercle bacilli.

The before-mentioned granules frequently lie at the ends of the bacillus, but they may occur a little distance from the extremities. They stain with the ordinary aniline dyes, but not by the method of Gram. The bacilli are non-motile.

This discovery indicates that epizootic abortion ought to be egarded as a specific uterine catarrh, determined by a definite pecies of bacterium.

The next object in the investigation was to cultivate the bacterium, and to furnish evidence that it constituted one definite species. This was accomplished by making cultures in est tubes containing serum-gelatine-agar and placing them in he incubator. At the end of two days in the case of the first ube, and two days after that in the case of the third (the econd tube was accidentally broken), there appeared a great number of very small colonies, which developed only in a definite zone of the tubes. This zone lay about ½ centimetre under the surface of the nutritive medium, and had a thickness of from 1 to 1½ centimetre; colonies were not present either above or below this.

After having succeeded in one case of epizootic abortion in detecting as the probable cause of the disease a particular bacillus, n the course of the following months twenty-one cases of epizootic abortion were investigated.

In cover-glass preparations made from the uterine exudate, he abortion bacilli were detected in almost all cases, partly ying free and partly collected together in intracellular heaps. The number of bacilli were very variable; in some preparations hey were immediately apparent, while in others they were very difficult to find. As a rule they were most easily found when he exudate contained very small greyish-white granules, which one may pick up with a needle. It need hardly be said that such preparations contained not only the abortion bacillus, but many other bacteria of various kinds. Nevertheless, from the great majority of the specimens the characteristic abortion bacilli were separated and pure cultures obtained.

It was found that the uterine catarrh which is set up by the abortion bacilli does not always entail the expulsion of the fœtus, but the result is sometimes merely the death of the fœtus.

The bacilli retain their vitality for at least seven months. This property of the abortion bacillus is of the very greatest importance in connection with the disease, of which it is the cause. It makes it easy to understand how a cow that has once aborted has a great tendency to abort again during the following pregnancy, since the bacilli remain in the uterus, unless a careful disinfection of the uterine cavity is carried out. The vitality of the bacillus also explains the difficulty which is encountered in getting rid of the disease from an infected building.

The above-described investigations made it highly probable that the specific cause of epizootic abortion had been discovered; but, in order to make the proof complete, it was necessary to bring about abortion by introducing the bacilli into the bodies of pregnant cows. This was done, and the results obtained appear to leave no doubt but that the true cause of epizootic abortion has been discovered by Dr. Bang.

The importance of this discovery it is difficult to estimate, as Professor Bang says: "So long as we did not actually know the contagion and its way of entrance into the body, and could merely form conjectures, we cannot wonder that the farmer did not recognise the necessity of taking immediate measures against infection, or that he grudged the necessary amount of trouble, and the not inconsiderable expense. Now that we are able to tell him that abortion belongs to the category of infectious diseases, and are able to explain to him that the agent of infection is in the uterus and first gains the outer world when the fœtus is expelled; that it afterwards may persist for months in the genital organs of the cow, and probably for just as long in the floor of the byre and on objects soiled with the vaginal discharges; that it is actually capable of penetrating from the vagina into the pregnant uterus; that the bull may be an active agent in the dissemination of the disease, &c., he will be more inclined to follow the advice of the veterinary surgeon."

In cases in which aborting cows have not been removed from the byre before abortion, it is obvious that one must carry out a careful disinfection of the byre, especially of the stalls of the ows, the gutter behind them, and all the utensils that may ave in any way become infected; the fœtus and its envelopes must be buried or burnt, and, if possible, the cow must be removed to another building, and attended by some person who is prohibited from entering the byre.

Careful cleansing and disinfection of the floor of the byre are also recommended. Under the head of disinfecting agents, Professor Bang calls attention to the free use of powdered lime which is sometimes used by the farmers in Denmark, as it has the advantage of not imparting any disagreeable smell to the milk, and of not diminishing the value of the dung.

Basic Slag *v.* **Superphosphate.**—There has recently been considerable discussion in the agricultural press regarding the relative value of these two manures. The majority of those who have taken part in this discussion have, in addition to recording their own experience, which is valuable, frequently gone further and drawn from that individual experience general conclusions which are consequently worthless. The action of any manure upon any crop will depend partly on the physical nature of the soil, and partly on the crop to which it is applied. But it will further depend both upon the store of plant food in the soil, and upon the manures which are used either immediately preceding or simultaneously with its own application. Again, the results will be influenced very much by the time of application in relation to the growth of the plant, and lastly, but not least, by the season. Even the above may not exhaust the conditions which will influence the result of an application of any one or more manures. Hence it is invariably difficult to draw general conclusions, and dangerous to do so from isolated results.

Among the contributions to the discussion which has prompted the above remarks there have been some few letters based on more general experience, especially a valuable one by Professor R. P. Wright, of the Glasgow Technical College, to the 'Agricultural Gazette,' in which the author gives his experience regarding the effect of these manures on the turnip crop. He says:—

"My conviction is that in most circumstances superphosphate is both a more effective and a more profitable manure to apply to the turnip crop than basic slag, and, as the question is one of much practical importance, allow me briefly to indicate the nature of the evidence which has led me to that conclusion. Experiments on the comparative merits of basig slag and superphosphate as turnip manures have been carried out in the south-west of Scotland in two seasons—in the year 1893, and in the year 1896. In 1893 the experiment was conducted on twelve farms scattered over nine counties. To one plot in the experiment superphosphate at the rate of 6 cwt. per acre was applied, and to an adjacent plot basic slag in quantity to supply an equal amount of phosphoric acid. On four of the farms the slag plot gave the largest crop, the increase over the superphosphate plot being on two 5 cwt. of roots, on one 10 cwt. roots, and on the fourth 15½ cwt. roots per acre. On one of these farms the soil was a poor moss, on two it was described as mossy loam, and on one as clay loam. On the remaining eight farms the superphosphate plot in every case gave the largest crop. The increases over the slag plot varied from 12 cwt. roots per acre to nearly 8½ tons, and averaged on the eight farms over 3 tons. The soils of these eight farms included light and medium loams, sandy and gravelly soils, and clay loams. Only on one farm out of the twelve did the slag prove superior in efficacy upon a soil not described as mossy in character, and as the superiority on that one field with a clay loam soil amounted to only 5 cwt. per acre, no stress could be placed on it. It was therefore inferred that on all ordinary turnip soils in the south-west of Scotland superphosphate was a more effective turnip manure than slag, and that the latter ought only to be preferred for soils of a peaty and mossy character.

"In the experiments of 1896 the two manures were again pitted against each other in a more complete series of experiments. Superphosphate alone was compared with slag alone, superphosphate and sulphate of potash were compared with slag and sulphate of potash; and superphosphate with nitrate of soda and sulphate of potash were compared with slag with the same nitrogenous and potassic manures. Moreover, superphosphate with farmyard manure was tried against slag with farmyard manure. The experiments were carried out on sixteen farms in seven counties in the South-West of Scotland. On each of these farms, therefore, slag either alone or with other manures was tried on four plots against other four plots to which superphosphate containing an equal quantity of phosphoric acid had been applied, and which in all other respects had received similar treatment. Therefore, in the experiments of 1896, there were in all sixty-four slag plots tried against sixty-four superphosphate plots. The soils included most varieties of arable soil on which turnips are commonly grown, there being light loams, stony soils, medium loams, and stiffish clay loams. On one farm the soil was a peaty loam, on two others slightly mossy. There were, however, no absolutely peaty soils included in the experiment fields of 1896.

"The results were much more decidedly in favour of superphosphate than in the experiments of 1893. Out of the whole sixty-four comparisons the superphosphate plots gave the largest crops on no less than fifty-eight plots. On six plots the slag gave larger crops than were got from the corresponding superphosphate plots; but even in these six cases the different plots on the same farm gave contradictory results, and no conclusions in favour of slag on these farms could be safely drawn. On no single farm out of the sixteen did slag show itself more effective than superphosphate on all the four plots. On two farms the slag-grown crop was superior on two plots each and inferior on two. On two more the slag crop was superior on one plot each and inferior on three. On the remaining twelve farms the superphosphate gave the larger crops on the whole forty-eight plots. On the average of all the comparisons the superphosphate crop was larger than the slag crop by more than 2½ tons per acre, while the difference in the cost of the two manures amounted to only 1*s.* per acre.

"It seems difficult to imagine what more decisive evidence could be desired than is afforded by these results. It appears to me to be quite impossible to escape the conclusion that a given quantity of phosphoric acid supplied as superphosphate, in ordinary circumstances and on ordinary turnip soils, may be relied on to give a considerably larger yield of turnips than the same amount of phosphoric acid supplied in basic slag. On exceptional soils, such as peats and mosses, it may be otherwise, and possibly where an attack of finger-and-toe is anticipated it may be advantageous to give the preference to basic slag. It is also to be remembered that these experiments have not included a complete inquiry into the effect of the two manures on the feeding value of the roots grown, and that the conclusions are based on quantity of produce only, apart altogether from quality."

Distribution of Alcoholic Ferments in Nature.—It has long been known that the yeast-plant is found upon the grape and other fruits containing sugar, and that it is from the skin of these fruits that the yeast enters into the juice when the fruit is crushed, and therein brings about the fermentation which results in the production of alcohol.

Further, it has been known that the yeast-plant can be found in the soil during some portion of the year. But the question how the yeast gets on to the fruit has been awaiting an answer. Recent researches, made by Amedeo Berlese, in Italy, have thrown some light upon the subject, and deserve to be better known. It is quite unnecessary to explain here the ingenious metho of research which he adopted, suffice it to give some of the results of these investigations. From April to June several varieties of yeast were found in the soil; in vineyards to a depth of 4 in., and in woods to a depth of 12 in. In June they are seldom to be found in the soil of the vineyard, and in July have altogether disappeared. One variety, which is often found in English orchards, was, up to June, distributed equally in the soil, in both sunny and shady places; but subsequently, where the soil was exposed to direct sunlight, it gradually became far less prevalent. Of course, we must not forget that the sun in Italy is far more powerful than in England. Numerous yeast-cells were found "on the thick and rough bark of the oak and olive-trees," and the number did not appear to depend at all upon the kind of tree, nor on the vicinity of vines. Some yeasts were found most frequently on the sunny side, others on the shady side of the tree, and the latter seem to be the best varieties for wine production. No alcoholic ferments could be found upon the grapes until June, nor were any found in the atmosphere during the months of April and June.

Having shown how widely the yeasts are distributed in Nature, the author next investigated the means by which they are transferred to the grape, or from one place to another. The description of these experiments is most interesting, and the results obtained are supported by such evidence as to render them conclusive. He proves that the yeasts are carried to the grapes by flies, ants, and other insects, which seek the grape for the sugar it contains.

Among these insects, the cellar fly, or gnat (*Drosophila cellaris*), plays an important part. He next proves that the alcoholic ferments are consumed by insects, especially Diptera (two-winged insects, such as flies), in their food, and pass in a living state through the digestive organs of these insects, without suffering any injury; in fact, they increase rapidly in the intestines, if the temperature and food are suitable, and are deposited by the insects upon grapes and elsewhere. The author comes to the conclusion that the chief agent in transporting the yeasts and other ferments from place to place is insect life, and not the atmosphere. He is even led to believe that some of the ferments may actually exist through the winter within the bodies of insects.

The Farmer's Library.

NOTES AND REVIEWS OF NEW BOOKS.

1.—*Woburn Experimental Fruit Farm.* Report by the DUKE OF BEDFORD and SPENCER U. PICKERING, F.R.S. London: Eyre and Spottiswoode. 5*s.*

IN the year 1894, the Duke of Bedford commenced to prepare some land destined to become an experimental fruit farm, with a view to ascertain facts relative to the culture of fruit and to increase our knowledge of, and to improve our practice in, this industry. This is the first Report published of the work which has been done, and though the authors say that it can consist of little else than a description of the ground and of the subjects which are being investigated, yet, as a matter of fact, it contains much valuable information, and a summary of the results obtained is given in the form of an appendix. The only fault we have to find with the book is, that, although it contains a good table of contents, there is no index. Considering the number of subjects dealt with, and that the book, while pleasant reading to all those who are interested in the culture of fruit, will be of value chiefly as a work of reference, we hope that this defect will be remedied in the next Report. The work will be found of very special value to those who are interested in the culture of apples and strawberries.

In the experiments with apple-trees normal treatment consists of planting the trees in trenched ground in the autumn, cutting the branches back to about a third of their length before the following spring, applying the mixed mineral manure in the autumn, and sodium nitrate in the spring, moderately pruning in autumn, and moderately shortening the growths in summer. All blossoms at the ends of shoots are removed, and the fruit is thinned in early summer, so as to leave not more than two fruits on the same spur.

If the results which have as yet been obtained are not numerous, they are both interesting and important. For take the following paragraph:—

> "A large number of the trees have suffered the dry season (1896) following their plantati damage suffered by these trees gives an excell tration of how much more liable trees on the c are to suffer under such circumstances than the paradise: out of seventy-four trees on t stock only four failed to 'start' satisfactorily, out of a similar number on the crab as many five did not start well, and, of these, fourteen nearly dead that they have had to be replaced trees."

Among other results of these experiments, we h struck by the following as regards apples, and thin facts cannot be too widely known.

> "The growth of grass around young apple-trees a very striking effect. The reduction in size of caused was 35 per cent. for dwarf trees, and 41 pe standards, the loss of wood growth being 87 per ce dwarfs, and 74 per cent. for the standards; in th the dwarf trees, too, there was a reduction of 71 in the weight of the fruit crop. The ill effect round the trees was much greater than that of w is probable, however, that in a wetter year the both grass and weeds would be considerably les the past dry seasons."

Eighty-six varieties of strawberries were planted, results of their growth have been carefully tabulat authors point out that:—

> "Considerable differences have been observe cropping qualities of the varieties; but the actu of crop must not be relied upon alone as an ind the usefulness of a variety, neither must it be that because certain strawberries have shown bett than others in the Ridgmount soil, and under the c prevailing there, they will do equally well e Even within the limits of the farm, the same have given different results according to their and there is evidence to prove that the strawber sensitive to slight variations in the conditions un it is grown."

One remarkable result was, that the strawberries which were supplied with water and various liquid manures after the fruit was set, showed that no increase whatever in crop had been produced thereby in any case, and that the ripening of the crop had been retarded by the dressings.

We have only briefly indicated a few of the results which have already been obtained by these experiments, and they certainly justify us in looking forward with interest to those which may be obtained in the future. The Report is admirably illustrated with reproduced photographs, which alone afford one of the best object lessons in fruit culture that we have ever seen.

2.—*Practical Forestry.* By C. E. CURTIS, F.S.I. London: Crosby Lockwood and Son. 3*s.* 3*d.*

THIS volume comprises the substances of a series of papers which were contributed to the "Land Agents Record." There is consequently a certain amount of repetition on the one hand, while on the other hand there are evident gaps in the treatment of the subject. Professor Curtis considers "that our woods and plantations are not such a source of income and wealth as they might be," and in his opinion one of the chief causes is the employment of incompetent foresters. He considers that "a real skilled forester or woodman is but occasionally found," yet "until such a class is obtainable, there is little hope of any great improvement in our system of arboriculture." Having stated the importance of a forest nursery, without which "forestry on a large scale can never pay," it is somewhat remarkable that no instruction is given in the book on the formation and tending of such a nursery. This is probably the chief omission. The main part of the work is devoted to a description of how to build up a plantation, and contains many valuable hints. Commencing with the soil—and, as the author says, "it is seldom that the forester will have to deal with the best and most fertile soils"—the whole of the operations necessary to the laying out of a plantation are considered in order. As regards the shape of the plantation, the Author recommends "a form which will serve both to shelter the plantation itself, and secure shelter for the surrounding land. This can be done by laying out convex lines on the exposed boundaries," and we thus "obtain the reverse, *i.e.* the concave, on the unexposed sides, which gives the greatest amount of shelter both to the live stock and the cultivated land."

The subject of drainage next receives attention, and the opinion is expressed that "only open drains and sometimes only grips are necessary," and that "covered drains are not only unnecessary but are detrimental." It is in these practical suggestions that the book will be found of most advantage to the forester, even though in many respects it may differ from his present notions with regard to management. Yet it is only by considering diverse views that he can hope to arrive at the best, and those who are not above learning, but are yet not prepared to take everything for gospel which appears in a book, will find this little work of value.

3.—*Agricultural Chemistry.* By R. H. ADIE, M.A., B.Sc., and T. B. WOOD, M.A. In two Vols. London: Kegan Paul, Trench, Trübner and Co., Limited. 7*s.*

THESE are two admirable books, well written, instructive, accurate, and thoroughly practical. Indeed, we have not had the pleasure of reading any work on Agricultural Chemistry for some time past which can compare with the second of these two volumes.

They are purposely written for students who have the means of carrying out the many experiments which are described, and we know no work which could with greater advantage be put into the hands of an agricultural student as a guide to his laboratory practice. As a rule, the time spent by most agricultural students in the laboratory is little better than wasted. It would be far otherwise if such books as these were used as text-books to help them in their practical work. The first volume might almost be described as a practical introduction to elementary chemistry, with special reference to its subsequent study from an agricultural point of view. The second volume is more especially agricultural, treating of soils, manures, and feeding substances.

No farmer could fail to obtain from this volume most valuable information, even though he may have but little acquaintance with chemistry; while the first volume would enable those who have studied chemistry some years since to regain their forgotten knowledge. As an illustration of the practical way in which subjects are treated, we may quote the following paragraphs on the comparative values of sulphate of ammonia and nitrate of soda:—

> "We may take it that for manurial purposes the value of a unit of nitrogen is the same in both these substances, so that their value is proportional to the percentage of

> nitrogen they contain. In average samples these percentages will be 15 and 20. One ton of nitrate of soda therefore contains as much nitrogen as ¾-ton of sulphate of ammonia, or to put it the other way round, the price of a ton of nitrate of soda should be the same as that of ¾-ton of sulphate of ammonia. For instance, if nitrate of soda costs 7*l.* 10*s.* per ton, then sulphate of ammonia, valuing the nitrogen at the same rate, should cost 10*l.* At these prices, the nitrogen in each costs 10*s.* per unit, supposing the above-mentioned percentages.
>
> "At the present time nitrate of soda costs 8*l.* 5*s.* per ton, and sulphate of ammonia only 8*l.* 10*s.* At the above percentages, the nitrogen in the sulphate of ammonia costs now only 8*s.* 6*d.* per unit, and is therefore much cheaper than in the nitrate.
>
> "The relative prices vary greatly from year to year, but it is always easy to decide in which the nitrogen is the cheaper as above."

The publisher announces that these volumes form part of agricultural series, and that others will follow on botany, ysiology, horticulture, and similar subjects, their object being o throw some light upon the possible remedies for the prelent depression in agriculture." As we believe that no nedy for this depression will be found so effective, as greater owledge and skill in the pursuit of the industry, we sincerely st that the subsequent volumes will be equal in usefulness those to which we have drawn attention.

—*The Foundations of Scientific Agriculture.* By SAMUEL COOKE. London: Longmans, Green and Co. 4*s.* 6*d.*

E contents of this book do not justify the title, which is ambitious. Scientific Agriculture is not limited to a sideration merely of the soil, its formation, cultivation, and nuring; and to a brief treatise on the structure and growth of nts, and of a few farm crops. If, therefore, the book had n simply intended for English readers, we should not have iced it, but the author is the Principal of the College of ence, at Poona, in India, and the work is mainly intended those who are at present, or who may become, interested in lian agriculture. The author would have been well advised have given his work a more definite title, and to have paid ater attention to those crops produced in India, in which so many Englishmen are interested, as for example, the tea-plant. There is unfortunately no index to the book, so that we cannot be quite certain whether any reference is made to this plant and its cultivation, but we do not remember having noticed it. Again, if there is any industry which needs improvement in India, it is the dairy industry in all its branches, about which nothing is said. There is, therefore, considerable room for improvement in a subsequent edition. The work, if made comprehensive and strictly applicable to Indian agriculture, would doubtless satisfy the want which, as the author states, at present exists for a text-book.

5.—*The Story of Germ Life. Bacteria.* By H. W. CONN. London: George Newnes, Limited. 1*s.*

PRESUMABLY the author of this work is the well known bacteriologist, Dr. Conn, of the Storrs Experiment Station, Connecticut, U.S.A., but there is nothing on the title-page, in the preface, or elsewhere, to indicate to the reading public that the book is written by one of the first bacteriologists living. At the present day it is impossible to take up a newspaper without finding somewhere in its columns the word "bacteria." That they play an important part in causing disease is universal knowledge, while the farmer of to-day finds that they are continually referred to in every agricultural paper as being the cause of much of the trouble which he has to contend against. Although several attempts have been made to write a simple story of their doings, we have not seen one which can compare with this little work.

Written in plain language and sufficiently, though not too well, illustrated, it puts before its readers, concisely and in a most interesting manner, without being abstruse or requiring a knowledge of scientific terms, a very complete view of our present knowledge of bacteria. What bacteria are is first made clear to the reader. Then the uses they are put to in the arts, as, for example, in the manufacture of vinegar, and in the curing of tobacco, &c., are described.

The third chapter deals with bacteria in the dairy, their effect on milk, butter, and cheese. Then come other aspects of the relation of bacteria to agriculture, as, for example, their influence in the silo and in the soil. The relation of bacteria to disease and the reasons why we are not all of us destroyed by these infinitely minute, though so terribly destructive legions, form the subject of a most instructive chapter, in hich the part played by the white blood corpuscles or phago-ytes is described and illustrated.

Lastly, the author treats of the various methods of combating arasitic bacteria.

It is like reading a fairy tale from commencement to end; he interest never flags. We can heartily recommend this ittle book to every farmer, and especially to all those who are nterested in dairy work.

6.—*Abridgments of Specifications, Class* 6. *Agricultural Appliances.* London: The Patent Office. 1*s*.

THE patent laws of this country are stated, by those who are supposed to understand them, to be sadly in need of revision. One of the peculiarities of these laws is, that they make no provision for an official search as regards novelty, and all patents are taken out at the risk of the inventors.

It is therefore incumbent on any person desiring to obtain a valid patent for an invention either to cause a search to be made, or himself to make a search, as to the novelty of his invention. By neglecting to make such a search many a patentee has found, after paying his fees, that his treasured patent is worthless, because it has been anticipated. Of course, in this case, the first applicant or patentee possesses all the patent rights, and the second one has absolutely no rights at all.

The result is that a law-suit is commenced by the first patentee against the second patentee, with the probability of the latter failing to obtain the gain which he anticipated from his patent, and being mulcted in the costs of a law-suit.

To assist would-be patentees in searching out for themselves whether their ideas have been anticipated and already patented, the Patent Office is publishing a series of indexes and abridgments as a guide to the specifications. In volume iv., 1893–94, we drew attention to one of these abridgments which covered the period from 1877 to 1883, and we have now received a continuation which covers the period 1884 to 1888. The volume before us refers to agricultural appliances for the treatment of land and crops, including gardening appliances. We note that there is another volume, No. 5, also dealing with agricultural appliances relating to the housing, feeding, and treatment of animals. So wide is the field of invention, that it has been found necessary to divide it into no less than 146 classes for the purpose of these abridgments.

The period 1884–88 appears to have been chiefly devoted to inventions for reaping, mowing, and harvesting, and to the production of sheafing and binding apparatus for corn &c., which machines have since become so popular. There also appears to have been considerable activity in regard to inventions connected with ploughs.

Conspicuous among the names of the inventors stand out those of J. Hornsby and J. Howard, whose machinery is so well known to all our readers.

Each abridgment is concise but clear, and many are fully and admirably illustrated. We recommend all those who are interested in improving agricultural machinery to study these volumes, more especially as they are sold at a price that puts them within the reach of every one.

7.—*The Rothamsted Experiments.* By C. J. R. TIPPER. London: Crosby Lockwood and Son. 3*s.* 6*d.*

THE aim of the author in this work is to recount, in a readable and practical form, the more obvious and useful lessons which may be learnt from these important investigations. The subject is divided into two parts, the first dealing with stock, the second with crops.

Those who have studied the Reports of the experiments at Rothamsted will agree with the author in his statement "that they abound with technicalities, and contain so much detail, that few except specialists can be expected to realise their meaning and value."

Such a criticism cannot be passed upon the present work. It is simply written, and after having stated the leading facts regarding our present knowledge of the subjects dwelt upon, the author indicates how far that knowledge has been derived from experiments made at Rothamsted.

The first part of the book includes such subjects as the feeding of cattle, sheep, pigs, and horses, whilst the second deals with the cultivation of swedes, turnips, mangels, and potatoes, of wheat, barley, and oats, and lastly of grass land.

The Rothamsted Experiments have been conducted for so long and the records are so voluminous, that it is difficult for the younger generation of farmers, either to obtain access to the original Memoirs, or to find time to read them, even if they have the opportunity of doing so. Moreover, much of the interest which was excited at the time of the original publication of these Memoirs has worn off, for views which were then new, and possibly opposed to the notions then prevalent, have now come to be accepted as correct, and the old ideas have died out. We therefore welcome any work which strives to make known to the present generation the very great debt which agriculture owes to Sir J. B. Lawes and Sir H. Gilbert.

8.—*The Rational Feeding of Live Stock.* Société de l'alimentation rationnelle du bétail. Compte Rendu du Premier Congrès. Paris, Imprimerie Nationale.

> "WHEN one considers the problem of how best to breed and feed cattle, one realises that while there exist a large number of precepts regarding which the best authorities are absolutely in accord, yet these precepts have not penetrated into general agricultural practice. Our first ambition will be to propagate these precepts among our rural population, and we believe that if we attain this end we shall have rendered no small service to our country.
>
> "We have also another ambition, it is to induce farmers to start experiments which may throw some light upon those obscure problems which neither science nor practice have yet solved."

These words are taken from the opening address by the President, Mons. Eugène Mir, of a French Society, the formation of which was successfully inaugurated in April last by a two days' Conference in Paris. Among the promoters of the Society are many eminent men, including M. E. Tisserand, M. A. Sanson, Professors Girard, Grandeau, and others who are well known in England.

During this two days' Conference some very excellent papers were read, and followed by lively discussions. The General Secretary, M. Mallèvre, in forwarding the Report of this Conference, asks what the Bath and West and Southern Counties Society has done towards promoting the rational feeding of live stock, and states that any communications sent to him will be brought before the next Congress, which takes place in March. The letter prompts us to suggest that there is perhaps as much scope in England for experiments relating to the feeding of live stock as there is in France. Manuring experiments have been conducted for many years past; but we recognise that live stock are the sheet-anchor of English agriculture. Can nothing be done to improve methods and reduce expenditure in stock management? We ve think that a careful study of the speeches made at th Congress might cause any feeders who hold this op reconsider it.

9.—*The Journal of the Royal Agricultural Society.* John Murray. 14*s.*

It is only possible to mention a few of the numerous a value contained in this volume. Dr. Munro and Mr. I an exhaustive paper on the manurial conditions affecting barley, come to the conclusion that barley after wheat for malting purposes than barley after roots, and that tl ditions affecting malting barley are bad or good in p as they affect maturation." Dr. Voelcker summa results which have been obtained at the Woburn Expe Farm, and Mr. R. H. Elliot explains the value of pl as tillers of the soil. The results of recent experin denitrification, which had been conducted mainly in G form the topic of an article by Dr. W. Somerville created at the time of its appearance an amount of and we may almost say of excitement, among agric which is still fresh in the memory of most readers of cultural press. Unfortunately, it was not until three afterwards that a most remarkable paper from the pen fessor Warrington, F.R.S., put an altogether differen upon the subject, and showed how easy it was for exp conducted upon a small scale to yield results which, true for the conditions under which they were obtaine not be true for other conditions. We cannot refra quoting some few words of Professor Warrington's appear to us to afford a well-timed warning to those w at conclusions as to the effect of manures from s isolated experiments. "We have, however, always to di between the facts proved by experiments, and the co which are drawn from them. The results of the exp are undoubtedly true, and demand most careful consi but to interpret these results, to grasp the principl underlie the actions observed, we must first of all be th acquainted with all the circumstances of the experim we must at the same time take into account any ot bearing on the question at issue. A true theory is o will explain *all* the facts, and not merely some of them last paper and one of the most valuable in the Jour

Sir John Lawes and Sir Henry Gilbert with respect to the Report of the Royal Commission on agricultural depression and the valuation of unexhausted manures. We cannot find space for even a brief summary of the conclusions to which the authors come, but must refer all those who are interested in the subject to the article itself.

10.—*The Transactions of the Highland and Agricultural Society of Scotland.* Edinburgh: William Blackwood and Sons. 5*s.*

THIS admirably printed and well illustrated Journal contains several valuable contributions.

Dr. Aitken reports the results of his experiments on feeding, an article on nitragin, and some interesting analyses of swedes grown by different farmers, from which it appears that the greater the size of the root, the greater the proportion of moisture it contains.

We have referred in former volumes to the experiments of Mr. John Speir as to the effects of food on milk and butter. These have been continued, and the results are recorded in an elaborate paper, to which it is not possible for us to do more than draw the attention of those who are studying this very complex subject. The other papers are upon a variety of subjects, including several which treat of the live stock of the farm.

11.—*The Agricultural Note-Book.* By PRIMROSE MCCONNELL, B.SC. London: Crosby Lockwood and Son.

THIS, the sixth edition of the author's well-known Note-book, has just reached us as we go to press, and time permits of only the briefest notice. The contents are in the main and of necessity the same as in previous editions, except that the slight errors which invariably find their way into a book crammed with condensed facts have so far as possible been corrected, while new matter has been added wherever possible, and all the data have been brought up to the present so as to include the results of recent investigations.

The contents are so diversified as to render the book of interest and value to every one connected, however slightly, with the land. The student of agriculture and the farmer of ripe experience will alike find it supply those facts which may for the moment have escaped the memory. To the landlord or the land agent it will be equally useful, and will frequently save much time by doing away with the necessity of wading through heavy tomes of diffuse information for the sake of some fact which may be buried therein.

The chief drawback to most of such Note-books is the difficulty of finding, in the mass of facts which they contain, just the one which the searcher needs. This difficulty the author has to a large extent overcome by the careful classification of the contents, and by a copious index.

The publishers are to be congratulated upon the improved shape and style of the book, which are greatly superior to that of former editions, and make it more suitable to carry in the pocket so as to be always handy for reference.

Bath and West and Southern Counties Society.

SOUTHAMPTON MEETING, 1897.

JUDGES.

HORSES.

Shire.—A. H. Clark, Moulton Eaugate, Spalding.

Other than Shire.—T. A. Spencer, Clavering Hall, Newport, Essex.

Hunters, Hacks, Ponies, and Harness.—Maxwell Angas, Manor House, Whissendine, Oakham.

CATTLE.

Devon.—T. H. Risdon, Washford, Taunton; N. Cook, Chevithorne, Tiverton.

Shorthorn.—G. Garne, The Brewery, Burford, Oxon; T. H. Hutchinson, Manor House, Catterick.

Hereford.—W. Price, The Vern, near Leominster.

Sussex.—A. Stanford, Eatons, Steyning, Sussex.

Jersey.—E. Mathews, Chequers Mead, Potters Bar; W. Ashcroft, 13, The Waldrons, Croydon.

Guernsey.—A. Dunlop, Church Farm, Hendon, N.W.

Aberdeen Angus.—Rev. C. Bolden, Preston Bissett, Buckingham.

Kerry and Dexter.—A. Deverell, Attington House, Tetsworth, Oxon.

Butter Tests.—E. Mathews, Chequers Mead, Potters Bar; G. T. Barham, College Farm, Finchley.

SHEEP.

Leicester.—E. F. Jordan, Eastburn, Driffield, East Yorks.

Cotswold.—R. Jacobs, Signett Hill, Burford, Oxon.

Kentish or Romney Marsh.—T. Powell, East Linham, Maidstone.

Devon.—J. N. Franklin, The Bussels, Huxham, Exeter.

Southdown.—H. Penfold, Selsey, Chichester.

Hampshire Down.—W. Newton, Crowmarsh Battle, Wallingford.

Shropshire.—C. Coxon, Elford Park, Tamworth.

Oxford Down.—W. D. Little, Middleton Stoney, Bicester.

Somerset and Dorset Horn.—H. Mayo, 4, Temple Terrace, Dorchester.

PIGS.

Berkshire.—Heber Humfrey, Shippon, Abingdon.

Large, Middle, and Small White, and Small Black.—D. Gibson, 98, New Street, Birmingham.

Tamworth.—W. H. Mitchell, Elmdene, Kenilworth.

POULTRY.

W. B. TEGETMEIER, North Finchley, London, N.; P. PERCIVAL, Somerset Court, Brent Knoll, Somerset.

PRODUCE.

Cheese.—J. HUDSON, jun., Ludgate Hill, London, E.C.
Butter and Cream.—T. NUTTALL, Manor House, Beeby, Leicester.
Cider.—H. C. BEDDOE, Hereford.

COMPETITIONS FOR MEN AND WOMEN.

BUTTER-MAKING.

PROF. CARROLL, Royal Albert Farm, Glasnevin, Dublin; T. NUTTALL, Manor House, Beeby, Leicester.

HORSE-SHOEING.

W. HUNTING, F.R.C.V.S., 16, Trafalgar Square, London, S.W.; H. G. ROGERS, M.R.C.V.S., 170, Brompton Road, London, S.W.

SHEEP-SHEARING.

J. D. ALLEN, Springfield, Pilton, Shepton Mallet.

MILKING.

R. J. HOSKINS, Hill View, Beard Hill, Shepton Mallet.

PRIZE AWARDS, 1897.

*** An animal designated in this list as the "reserve number" is entitled, *conditionally*, to succeed to any prize that may become vacant in its class by reason of the animal placed above it by the Judges failing afterwards to qualify.

† Animals, where not otherwise stated, may be considered to have been bred by the Exhibitor.

ABBREVIATIONS EXPLAINED:—S., sire; d., dam; s. of d., sire of dam; y., year; m., month; w., week; d., day; R., Reserve; V.H.C., Very Highly Commended; H.C., Highly Commended; C., Commended.

All ages calculated to May 24, 1897.

HORSES.

FOR AGRICULTURAL PURPOSES.—SHIRE.

(Eligible for the Shire Horse Society's Stud Book.)

CLASS 1.—*Shire Stallion, foaled before* 1895. [5 entries.]

I. (£20.)—Sir W. H. WILLS, Bart., M.P., Coombe Lodge, Blagdon, R.S.O., Somerset, brown, **Calwich Prince** (15,531), 3 y., bred by W. Ferneyhough, Moss Leigh Farm, Cheddleton Leek; s., Prince Harold (14,428); d., Rose, by Premier (2646).

II. (£10.)—J. F. SHEPPARD, Swathling Farm, near Southampton, brown, **Swathling Harold**, foaled 1892; s., Rokeby Hermit (12,619); d., Rose; s. of d., Warrior (2689).

CLASS 2.—*Shire Stallion, foaled in* 1895. [7 entries.]

I. (£20.)—LORD ROTHSCHILD, Tring Park, Tring, bay, **Bar None's Rival** (S.H.B.S., 15,970), about 2 y.; s., Gunthorpe Advance (13,136); d., Lively (12,798); s. of d., Rival (2885).

II. (£10.)—P. A. WILLETT, Denton, Newhaven, Sussex, grey, **Bar One William II.** (15,972), 2 y., 1 m., bred by F. W. Griffin, Boro' Fen, Peterborough; s., Bar None William (10,903); d., Lake Fairy (10,291); s. of d., True Briton (2684).

III. (£5.)—J. A. BARRS, Nailstone, Nuneaton, bay, **Nailstone Royal Duke** (16,279), 2 y.; s., Nailstone Rising Star (14,754); d., Nailstone May Queen (17,085); s. of d., Big Ben (3459).

R. & H. C.—A. J. HOLLINGTON, Forty Hill, Enfield, Middlesex, bay, **Enfield Prince**, 2 y., bred by John Harrison, Stanton, Ashbourne; s., Thorney Prince (4745); d., Alvaston Gem (13,916).

CLASS 3.—*Shire Colt, foaled in* 1896. [9 entries.]

I. (£15.)—LORD ROTHSCHILD, Tring Park, Tring, black, **Pioneer**, about 1 y., bred by A. E. S. Hepworth, Essex Farm, Blackthorne, near Bicester:

s., Harold's Pilot (S.H.S.B., 11,564); d., Flower (vol. xix.); s. of
(vol. xix.).

II. (£10.)—J. A. Barrs, Nailstone, Nuneaton, bay, 1 y., br
Garner, Packington, Ashby-de-la-Zouch; s., Nailstone Rising St
d., Bonny (vol. viii.); s. of d., Honest Tom 2nd (1122).

III. (£5.)—H.R.H. the Prince of Wales, K.G., Sandringh
Honest Squire, 1 y.; s., Honest Tom (5123); d., Royal La
Lincolnshire Lad 2nd (1365).

R.—Lord Llangattock, The Hendre, Monmouth, blac
Baronet, 1 y.; s., Prince Harold (14,228); d., Hendre Barone
Dunsmore Barrier.

H. C.—L. Deadman, Brockbampton, Havant, black, **Byf**
11 m., bred by C. T. Edwards, Byford Court, Hereford;
(14,863); d., Byford Rose (vol. xvi., 17,933); s. of d., Rok
(12,169).

Class 4.—*Shire Mare and Foal, or in-Foal.* [6 ent

I. (£20.)—Sir W. H. Wills, Bart., M.P., Coombe Lodge, Blag
Somerset, brown, **Waresley Dona,** 5 y., bred by W. H. O.
Waresley Park, Sandy, Hunts; s., Bury Victor Chief (11,105)
s. of d., Premier (2646); with foal by Duke of Worsley (13,002).

II. (£10.)—Lord Llangattock, The Hendre, Monmouth, r
more **Fashion 2nd** (6281), 10 y., bred by R. Capes, Grange-
s., Vulcan (4145); d., Kit (Capes); s. of d., Champion (440); w
Prince Harold (14,228).

III. (£5.)—W. H. Godding, Brimslade, Marlborough, bay,
Princess Royal, 4 y., 3 w.; s., Prince William (3956); d.
Queen (vol. xi.); s. of d., William II. (4798); with foal by
(15,159).

Extra Local (£10.)*—W. H. Gulliver, Wimpson Farm
Southampton, bay, **Flora** (18,204), 4 y., bred by A. C. Rog
House, Buckingham; s., Harold's Pilot (11,564); d., Buckingh
(8673); s. of d., Royalist (2488); with foal by Southga
(15,856).

Class 5.—*Shire Filly, foaled in* 1894. [6 entries

I. (£10) and Special.†—Lord Rothschild, Tring Park,
Miss Constance, about 3 y., bred by Trustees of M. Durhan
Thorne, near Doncaster; s., Engineer 2nd (9300); d., Diamon
Royal Albert (1885).

II. (£5.)—Sir W. Gilbey, Bart., Elsenham Hall, Essex, bl
gill **Flower** (22,748), 3 y., bred by W. Whipp, Withgill
Clotheroe; s., Siddows Wonder (13,587); d., Evening Ligh
s. of d., Vulcan (4145).

III. (£3.)—A. J. Hollington, Forty Hill, Enfield, Mid
Saxon Daisy, 3 y., bred by Sir W. Gilbey, Bart.; s., Mars Vi
d., Olinder (10,606); s. of d., Royal Albert (1885).

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* Given by the Southampton Local Committee for Best Entry in
or 9, the property of a resident within a radius of ten miles from
Southampton.

† A Gold Medal, value 10*l.*, given by the Shire Horse Society,
or Filly in Class 4, 5, 6, or 7, under Special Conditions, as stated in

I. C.—H. P. Taunton, Downton, Salisbury, bay, **Westwood Duchess** ,692), 2 y., 10 m., bred by Lady Hunt, Weston, Derby; s., Reciprocity 83); d., Horbling Empress (12,656); s. of d., Tom King (2158).

Class 6.—*Shire Filly, foaled in* 1895. [6 entries.]

. (£10) and **R.** for Special.*—H.R.H. the Prince of Wales, K.G., ıdringham, bay, **Sea Breeze,** 2 y., bred by — Thorley, Mayfield, Ashrne; s., Calwich Blaze (14,544); s. of d., Royal 2nd (8107).

I. (£5.)—Lord Llangattock, The Hendre, Monmouth, bay, **Tatton nflower,** 2 y., bred by N. Pennington, Bollington, Altrincham; s., yal William II. (12,207); d., The Empress (15,789); s. of d., Coronet 50).

II. (£3.)—Lord Rothschild, Tring Park, Tring, Herts, grey, **Moorish iiden,** about 2 y., bred by R. Wainwright, Sweeney, Oswestry; s., gent 2nd (6316); d., Dorothy; s. of d., Lincolnshire Lad (1365).

R.—H. P. Taunton, Downton, Salisbury, bay, 2 y.

I. C.—Sir W. Gilbey, Bart., Elsenham Hall, Essex, bay, **Boro rling** (21,381), 2 y., bred by F. W. Griffin, Boro Fen, Peterborough; s., : None William (10,903); d., Black Queen (17,776); s. of d., King John 02).

Class 7.—*Shire Filly, foaled in* 1896. [8 entries.]

. (£10.)—J. A. Barrs, Nailstone, Nuneaton, black, **Nailstone Baroness** l. xix.), 1 y., bred by Mrs. Barrs, Odstone Hall, Atherstone; s., Nailstone yal Standard (14,757); d., Odstone Baroness (vol. xiii., 13,099); s. of d., idsman (8759).

I. (£5.)—Lord Rothschild, Tring Park, Tring, brown, **Harold's Gem,** ut 1 y., bred by G. D. Lucas, Broadlow Ash, Thorpe, Ashbourne; s., rold (3703); d., Broadlow Princess (6904); s. of d., Sir Garnet (4037).

II. (£3.)—Sir W. Gilbey, Bart., Elsenham Hall, Essex, bay, **Saxon tty,** 1 y.; s., Prince William (3956); d., Olinda (10,606); s. of d., Royal ert (1885).

R.—Lord Llangattock, The Hendre, Monmouth, bay, **Hendre Starht,** 1 y.; s., Prince Harold (14,228); d., Hendre Star; s. of d., Regent 2nd 16).

I. C.—H.R.H. the Prince of Wales, K.G., Sandringham, chestnut, ., bred by — Leary, Middle Drove, Wisbech; s., Whirlwind (14,935); Flower; s. of d., Sprotbro' Masher (8272).

ANY AGRICULTURAL BREED EXCEPT SHIRE.

Class 8.—*Mare and Foal, or in-Foal.* [7 entries.]

. (£20.)—Lords A. and L. Cecil, Orchardmains, Tonbridge, bay Clydese, in-foal, **Clara** (11,250), 10 y., s., Claymore (3522); d., Darling 93); s. of d., Topsman (886).

I. (£10.)—J. Brown, Marden Farm, Hertford, bay Clydesdale, **London ssie,** 4 y., bred by James Young, Peatland Dundonald, Ayrshire; Prince Alexander (8899); d., Princess of Avondale; s. of d., Prince of les (673); with foal by London Lad (10,081).

A Gold Medal, value 10*l.*, given by the Shire Horse Society, for Best Mare illy in Class 4, 5, 6, or 7, under Special Conditions, as stated in Prize List.

III. (**£5.**)—J. Holm, Waterend, Ongar, brown, **Tulop**, 4 y., 11 m.; s., Prince of Kyle; d., Tulop; s. of d., Top Gallant; with foal.

R. for Local Prize.*—J. E. A. Willis Fleming, Chilworth Manor, Romsey, chestnut roan, **Violet**, 9 y., bred by W. Bunce, Pewsey, Wilts; with foal by Bacchus 4th.

Class 9.—*Filly foaled in* 1894. [1 entry.]

I. (**£10.**)—Lady A. Cecil, Orchardmains, Tonbridge, bay Clydesdale, **Kitty of Kircudbright**, 3 y., bred by J. Campbell, Skagman, Castle Douglas, N.B.; s., McMeeken (9600); d., Young Kate (7045); s. of d., King Victor (1708).

Class 10.—*Filly, foaled in* 1895. [2 entries.]

I. (**£10.**)—Lords A. and L. Cecil, Orchardmains, Tonbridge, bay Clydesdale, **Caress**, 2 y.; s., Prince Eddie (9637); d., Cynthia (14,252); s. of d., Claymore (3522).

Class 11.—*Filly, foaled in* 1896. [2 entries.]

I. (**£10.**)—J. Brown, Marden Farm, Hertford, bay Clydesdale, **London Starlight**, 11 m., bred by J. Nicholl, Bramfield; s., Earl Percy (6707); d., Missie.

II. (**£5.**)—Lords A. and L. Cecil, Orchardmains, Tonbridge, bay Clydesdale, **Cyclamen**, 1 y., 1 m., 16 d.; s., Exquisite (8921); d., Flower of Kilbride (11,251); s. of d., Lord Erskine (1744).

HUNTERS.

Class 12.—*Hunter Mare and Foal, or in-Foal.* [3 entries.]

I. (**£20.**)—A. Brown, Hill Farm Dairy, Southampton, dark brown, 8 y.; with foal.

R.—Mrs. H. B. Cory, Druidstone, Castleton, Cardiff, brown, **Brenda**, 5 y., bred by H. B. Cory, Druidstone, Castleton, Cardiff; s., Free Trade; d., Carmen (962); with foal by Yard Arm.

Class 13.—*Hunter Mare or Gelding, foaled in* 1893. [4 entries.]

I. (**£20.**)—T. D. John, Chaldean's Stud Farm, St. Fagans, near Cardiff, chestnut gelding, **Rockville**, foaled 1893.

II. (**£10.**)—G. P. Finch, The Briars, Exeter, brown gelding, **Masher Lancastran**, 4 y., 1 w.; s., Lancastran; d., Rosebede; s. of d., The Bustard.

R.—Holt and Holt Needham, Castle Cary, Somerset, brown mare, **Nightingale** (1151), 4 y., 1 w., bred by A. V. Sherrin, High Ham, Langport, Somerset; s., Lancastrian; d., Ruby; s. of d., Glenmore.

Class 14.—*Hunter Filly or Gelding, foaled in* 1894. [5 entries.]

I. (**£15.**)—T. Bradley, The Manor Farm, Uffington, Stamford, bay gelding, **Sequent**, 3 y., 1 m.; s., Havoc; d., Sally.

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* Given by the Southampton Local Committee for Best Entry in Class 4, 5, 8, or 9, the property of a resident within a radius of ten miles from the Bargate, Southampton, 10*l.*

II. (£10.)—Holt and Holt Needham, Castle Cary, Somerset, chestnut illy, **Rocket** (1189), 3 y., 1 m., 3 w., bred by T. H. Miller, Oborne, Sher-orne, Dorset; s., Lifeboat (vol. xvi. pp. 160, 768); d., Midnight (1121); . of d., Ruddigore (vol. xvi. p. 49; xvii. p. 941).

R. & C. and Special.*—J. Flower, Chilmark, Salisbury, Wilts, chestnut illy, **Meadow Sweet,** 3 y.; s., Marshal Soult; d., Lottery (H.I.S.B., 099).

C. & R. for Special.*—E. Baigent, Worldham, Alton, Hants, chestnut illy, **Miss Cribb** (1132), 3 y., bred by J. H. Large, Crudwell, Malmesbury, Vilts; s., Tom Cribb; d. by Victor.

Class 15.—*Hunter Filly or Gelding, foaled in* 1895. [3 entries.]

I. (£10.)—T. D. John, Chaldean's Stud Farm, St. Fagans, near Cardiff, black brown gelding, **Goldfinder,** foaled 1895, bred by — Bagnall, Westvell, Burford, Oxon; s., Strathmore.

II. (£7.)—T. Bradley, The Manor Farm, Uffington, Stamford, brown gelding, **Sequel,** 2 y., 1 m.; s., Havoc; d., Sally.

R. & H. C.—J. Benett-Stanford, Pyt House, Tisbury, chestnut gelding, **Rufus,** 2 y., 2 w., bred by S. A. Hiscock, North Hays, Motcombe, Dorset; s., Marioni; d., Bess.

Class 16.—*Hunter Filly, Colt or Gelding, foaled in* 1896. [8 entries.]

I. (£10.)—T. Bradley, The Manor Farm, Uffington, Stamford, black colt, **Scamp,** 1 y.,; s., Ismane; d., Duchess.

II. (£7.)—Holt and Holt Needham, Castle Cary, Somerset, chestnut colt, **Red Light,** 1 y., 1 w.; s., Yard Arm; d., Ruby; s. of d., Glenmore.

III. (£3.)—Holt and Holt Needham, chestnut gelding, **Priestcraft,** 1 y., 3 w.; s., Yard Arm; d., Goodcraft (187); s. of d., King Crafty.

R.—G. P. Finch, The Briars, Exeter, chestnut gelding, **Eclipse 2nd,** y., 2 w.; s., Eclipse; d., Rosebede; s. of d., The Bustard.

HACKNEYS.

Class 17.—*Hackney Mare or Gelding, foaled before* 1893, *over* 14 *hands.* [7 entries.]

I. (£10.)—S. B. Carnley, Norbury House Stud, Alford, Lincolnshire, elding, **Norbury Squire,** 6 y., bred by D. Cooper, Catterick, Yorkshire; , Danegelt (174 H.S.B.).

II. (£5.)—The Horsley Stud Company, Pound Stud Farm, Cobham, urrey, bay gelding, foaled 1891.

III. (£2.)—S. Brunton, Frogmore House, St. Albans, red roan mare, **Snowstorm,** 6 y.

R.—H. Keene, 8a, Carlton Crescent, Southampton, black gelding, **The Toff,** 6 y.

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[*] Given by he Hunters' Improvement Society, a Silver Medal for the Best Hunter Filly in Class 14, 15, or 16, not exceeding three years old (foaled in 894, 1895, or 1896), subject to Special Conditions as stated in Prize List.

CLASS 18.—*Hackney Mare or Gelding, foaled in* 1893 *or* 1894, *over* 14 *hands.* [2 entries.]

I. (£10.)—F. J. BATCHELOR, The Reddings, Moor Green, Birmingham, chestnut gelding, **Hopwood Squire,** late **Active,** 4 y , bred by W. Bellamy, Copalder, Doddington, Cambs ; s., Copalder Cadet; d., Lady of the Lake (5618); s. of d., Cooke's Canvasser.

PONIES.

CLASS 19.—*Pony Mare or Gelding,* 4 *years old or over, not exceeding* 14 *hands.* [5 entries.]

I. (£10.)—O. G. SMITH, Crown Hotel, Southampton, red roan mare, **Kitty,** 4 y., bred by C. Glenny, Feltham; s., Tit Bits 2nd.

II. (£5.)—J. R. G. FOWLE, Home Farm, Eastleigh, bay gelding, **Nimrod,** 5 y.

CLASS 20.—*Pony Mare or Gelding,* 4 *years old or over, not exceeding* 13 *hands.* [4 entries.]

I. (£10.)—S. BRUNTON, Frogmore House, St. Albans, bay mare, **Surprise,** 7 y., 11 m.

II. (£5.)—W. J. P. LANSDOWN, Castle Street, Bristol, brown gelding, **Satisfaction,** aged.

R. and Extra **(£10.)***—MRS. M. WALLIS, King's Court, Chandlersford, brown gelding, **Joey,** 7 y.

HARNESS.

CLASS 21.—*Harness Mare or Gelding,* 4 *years old or over, exceeding* 14 *hands.* [12 entries.]

I. (£10.)—F. J. BATCHELOR, The Reddings, Moor Green, Birmingham, chestnut gelding, **Hopwood Squire,** late **Active,** 4 y., bred by W. Bellamy, Copalder, Doddington, Cambs; s., Copalder Cadet; d., Lady of the Lake (5618); s. of d., Cooke's Canvasser.

II. (£5.)—S. B. CARNLEY, Norbury House Stud, Alford, Lincolnshire, gelding, **Norbury Squire,** 6 y., bred by D. Cooper, Catterick, Yorkshire; s., Danegelt (174 H.S.B.).

III. (£2.)—The HORSLEY STUD COMPANY, Pound Stud Farm, Cobham, Surrey, bay gelding, foaled 1891.

R. & V. H. C.—G. B. HULME (of New York), care of J. Nugent, Wallington House, Farnham, Hants, chestnut gelding, **Great Scott,** bred in Canada; s., Olive Wilkie (American Trotter).

H. C.—F. B. BLOSSET MAULE, Danehurst, Hordle, Lymington, bay gelding, **Prince Alfred,** 4 y., 11 m., bred by H. W. Jermyn, Wymondham, Norfolk; s., Monarch (463 H.S.B.); s. of d., Old Confidence (158 H.S.B.).

CLASS 22.—*Harness Mare or Gelding,* 4 *years old or over, not exceeding* 14 *hands.* [11 entries.]

I. (£10.)—S. BRUNTON, Frogmore House, St. Albans, bay mare, **Surprise,** 7 y., 11 m.

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* Given by the Southampton Local Committee for Best New Forest Pony exhibited in Class 20.

II. (£5.)—J. R. G. Fowle, Home Farm, Eastleigh, bay gelding, **Nimrod,** 5 y.

III. (£2.)—O. G. Smith, Crown Hotel, Southampton, red roan mare, **Kitty,** 4 y., bred by C. Glenny, Feltham; s., Tit Bits 2nd.

CATTLE.

DEVON.

Class 23.—*Devon Bull, calved in* 1893 *or* 1894. [5 entries.]

I. (£15.)—Edward Mucklow, Whitstone Head, **Magna Charta** (3527), 3 y., 2 m., 2 w., 2 d.; s., Whitstone Merryman (3211); d., Dorothy (11,670); s. of d., Lord Wolesley (2063).

II. (£10.)—Edward Mucklow, **Landscape** (3371), 4 y., 2 m., 3 w., 3 d.; s., Lovely Laddie (2612); d., Dorothy (11,670); s. of d., Lord Wolesley (2063).

R. & H. C.—J. C. Williams, Caerhays Castle, St. Austell, **Pretty Middling 4th** (3337), calved 23rd Jan., 1893, bred by Sir W. R. Williams, Bart., Upcott, Barnstaple; s., Pretty Middling (2857); d., Fiction 2nd (11,108); s. of d., Foreman 2nd (1969).

H. C.—Hon. E. W. B. Portman, Hestercombe, Taunton, **Hardanger** (3594), 2 y., 7 m., 4 d.; s., Harold (2790); d., Rumsey (11,449); s. of d., Lord Noble (1785).

C.—J. T. Ensor, The Firs, Wimborne, **Moderator** (3487), 3 y., 3 m., bred by J. C. Williams; s., Whitehall (2175); d., Molley 3rd (12,567); s. of d., Marmaduke (2280).

Class 24.—*Devon Bull, calved in* 1895. [6 entries.]

I. (£15.)—E. Kidner, Cothelstone, Taunton, Somerset, **Harold 4th** (3595), 2 y., 4 m., 6 d.; s., Harold 3rd (3127); d., Lady Hestercombe (9683); s. of d., Harold (2793).

II. (£10.)—A. C. Skinner, Pound Farm, Bishop's Lydeard, Somerset, **Duke of Pound 27th** (3572), 2 y., 5 d.; s., Lord Punchard (3148); d., Duchess 17th (8988); s. of d., Lord Currypool (1589).

III. (£5.)—E. Mucklow, Whitstone Head, **Commander-in-Chief** (3670), 2 y., 3 w., 6 d.; s., Marquis of Wolesley (3162); d., Whitstone Rosewater (12,956); s. of d., Duke of Pound 16th (2391).

R. & H. C.—H. P. Tucker, Horridge Farm, near Barnstaple, **Mistletoe of Pound,** 2 y., 3 w., 3 d., bred by A. C. Skinner; s., Lord Punchard (3148); d., Myrtle 41st (13,084); s. of d., Masterpiece (2837).

C.—C. Pratt, Tale House, Payhembury, Ottery St. Mary, **Neptune,** 2 y., 3 m., 3 w., bred by J. C. Williams, Caerhays Castle, St. Austell; s., Captain (2204); d., Nessie (7989); s. of d., Sir Michael (1646):—and J. C. Williams, **Farrier** (3585), calved 20 Jan., 1895; s., Pretty Middling 2nd (3172); d., Fashion 3rd (12,579); s. of d., Captain (2204).

Class 25.—*Devon Bull, calved in* 1896. [11 entries.]

I. (£15.)—Sir W. H. Walrond, Bart., M.P., Bradfield, Cullompton, Devon, **Royalist 2nd of Pound** (3807), 1 y., 3 m., 3 w., 1 d., bred by A. C. Skinner, Pound, Bishop's Lydeard, Somerset; s., Masterpiece (2837); d., Rosalie (10,175); s. of d., Rob Roy (1831).

II. (£10.)—E. Mucklow, Whitstone Head, **Prince Royal**, 1 y., 4 m., 2 w., 6 d.; s. Marquis of Wolesley (3162); d., Kathleen (9563); s. of d., Duke of Flitton 17th (1544).

III. (£3.)—E. Kidner, Cothelstone, Taunton, Somerset, **Giant** (3738), 1 y.; s., Harold 3rd (3127); d., Dairymaid 3rd (14,529); s. of d., Harold (2790).

R. & H. C.—A. Bowerman, Capton, Williton, Taunton, **Bulawayo**, 1 y., 2 m., 1 w., 1 d.; s., Pretty Middling 3rd (3173); d., Rose (13,783); s. of d., Palmerston (2474).

H. C.—A. Bowerman, **Trump 3rd of Pound**, 1 y., 1 m., 6 d., bred by A. C. Skinner, Pound, Bishop's Lydeard; s., Duke of Pound 23rd (3265); d., Tulip 9th of Pound (13,616); s. of d., Masterpiece (2837).

C.—E. Kidner, **Harold 5th** (3748), 1 y., 4 m., 3 w., 3 d.; s., Harold 3rd (3127); d., Lady Cheddon (14,536); s. of d., Harold (2790):—and Hon. E. W. B. Portman, Hestercombe, Taunton, **Silver King** (3810), 1 y., 1 m., 2 w., 3 d.; s., Duke of Currypool (3096); d., Ruth (11,450); s. of d., Lord Noble (1785).

Class 26.—*Devon Cow, in-Milk or in-Calf, calved before* 1894. [4 entries.]

I. (£15.)—A. C. Skinner, Pound Farm, Bishop's Lydeard, Somerset, **Moss Rose 22nd of Pound** (13,608), 4 y., 3 m., 3 d.; s., Masterpiece (2837); d., Moss Rose 16th (11,737); s. of d., Baron Golsoncott 4th (2193).

II. (£10.)—E. J. Stanley, M.P., Quantock Lodge, Bridgwater, **Princess Dorothy**, 7 y., 11 m., 2 w.; s., Tempter 2nd (2153); d., Princess (9099); s. of d., General Colley (1564).

R. & H. C.—Hon. E. W. B. Portman, Hestercombe, Taunton, **Lady Kidland 3rd** (15,341), 4 y., 11 m., 3 w., 2 d., bred by W. N. Greenham, Overton, West Monkton, Taunton; s., Viscount (2694); d., Lady Kidland 2nd; s. of d., Earl of Dodington (1725).

Class 27.—*Devon Heifer, in-Milk or in-Calf, calved in* 1894. [7 entries.]

I. (£15.)—A. C. Skinner, Pound Farm, Bishop's Lydeard, Somerset, **Duchess 38th of Pound** (14,174), 2 y., 8 m., 1 w., 2 d.; s., Masterpiece (2837); d., Duchess 29th (11,727); s. of d., Baron Golsoncott 4th (2193).

II. (£10.)—J. C. Williams, Caerhays Castle, St. Austell, **Nessie 2nd** (14,292), calved 22nd Jan., 1894; s., Cardsharper (3082); d., Nessie (7989); s. of d., Sir Michael (1646).

III. (£3.)—A. Bowerman, Capton, Williton, Taunton, **Majestic** (13,767), 2 y., 4 m., 3 w., 3 d.; s., Starlight (3514); d., Snow (13,786); s. of d., Admiral Wood (1880).

R. & H. C.—E. J. Stanley, M.P., Quantock Lodge, Bridgwater, **Quantock Princess** (14,215), 3 y., 4 m., 1 w., 2 d.; s., Baronet (1897); d., Princess Dorothy (11,039); s. of d., Tempter 2nd (2153).

H. C.—Hon. E. W. B. PORTMAN, Hestercombe, Taunton, **Cherry** (14,656), y., 7 m., 1 w., 3 d.; s., Duke of Currypool (3096); d., Duchess 2nd 2,645); s. of d., Nobleman (2848).

CLASS 28.—*Devon Heifer, calved in* 1895. [9 entries.]

I. (£10.)—Sir W. WILLIAMS, Bart., Upcott, Barnstaple, North Devon, **ashion 5th,** 2 y., 1 m., 3 w.; s., Pretty Middling (2859); d., Fashion nd (11,888); s. of d., Captain (2204).

II. (£5.)—A. C. SKINNER, Pound Farm, Bishop's Lydeard, Somerset, **Rosalie 4th of Pound** (14,783), 2 y., 4 m., 6 d.; s., Compensator (2942); d., Rosalie 2nd (13,087); s. of d., Milkman (2841).

III. (£2.)—E. MUCKLOW, Whitstone Head, **Whitstone New Year's Gift** (14,615), 2 y., 4 m., 3 w., 3 d.; s., Landscape (3371); d., Lady Ida 12,385); s. of d., Duke of Bourton (2581).

R. & H. C.—A. BOWERMAN, Capton, Williton, Taunton, **Sally,** 2 y., 4 m., w.; s., Starlight (3514); d., Dolly 5th (9482); s. of d., Lord Ilbear (1779).

H. C.—A. C. SKINNER, **Fancy 21st of Pound** (14,774), 1 y., 11 m., w., 5 d.; s., Compensator (2942); d., Fancy 17th (12,430); s. of d., General Gordon (1974).

C.—E. MUCKLOW, **Whitstone Cherry Ripe** (15,291), 1 y., 11 m., 3 w., d.; s. Landscape (3371); d., Whitstone Cherry Blossom (12,948); s. of d., The Vicar (2156):—Hon. E. W. B. PORTMAN, Hestercombe, Taunton, **Belle f Curry** (14,654), 2 y., 3 m., 2 w.; s., Duke of Currypool (3096); d., uth (1145); s. of d., Lord Noble (1785):—and E. J. STANLEY, M.P., Quantock Lodge, Bridgwater, **Quantock Lady Currypool 9th** (14,804), y., 1 m., 3 w.; s., Tregothnan (2902); d., Lady Currypool 6th (12,120); of d., Duke of Wellington (1955).

CLASS 29.—*Devon Heifer, calved in* 1896. [13 entries.]

I. (£7.)—E. KIDNER, Cothelstone, Taunton, **Beauty** (15,193), 1 y., 3 m., w.; s., Harold 3rd (3127); d., Beauty 4th (14,575); s. of d., Harold 2790).

II. (£5.)—Sir W. WILLIAMS, Bart., Upcott, Barnstaple, N. Devon, **Fiction 6th,** 1 y., 4 m., 3 w.; s., Pretty Middling 2nd (3172); d., Fiction 4th (12,580); s. of d., Captain (2204).

III. (£2.)—E. J. STANLEY, M.P., Quantock Lodge, Bridgwater, **Quantock Beauty 13th** (15,421), 1 y., 4 m., 4 d.; s., Tregothnan (2902); d., Beauty th (12,118); s. of d., Duke of Wellington (1955).

R. & V. H. C.—A. BOWERMAN, Capton, Williton, Taunton, **Mustard,** 1 y., m., 1 w., 4 d.; s., Lord Culverhay (3469); d., Apricot (13,743); s. of d., Palmerston (2474).

H. C.—A. BOWERMAN, **Nutmeg,** 1 y., 1 m., 3 d.; s., Pretty Middling 3rd 3173); d., Famous (13,755); s. of d., Starlight (3514):—and A. BOWERMAN, **Model,** 1 y., 4 m., 5 d.; s., Pretty Middling 3rd (3173); d., Beauty 4th 13,744); s. of d., Duke of Wellington (1955).

C.—E. MUCKLOW, Whitstone, **Whitstone Rose Tint** (15,306), 1 y., w., 3 d.; s., Merryman; d., Whitstone Rose Water (12,956); s., Duke of Pound 16th (2391):—and for his **Whitstone Ladylike** (15,297), 1 y., m., 5 w., bred by N. Cook, Chevithorne, Tiverton; s., Royalist of Pound 3350); d., Lady Jane (10,373); s. of d., Champion (1696):—Hon. E. W. B. PORTMAN, Hestercombe, Taunton, **Gentlemaid** (15,340), 1 y., 4 m., 1 w.,

6 d.; s., Duke of Currypool (3096); d., Beatrice (11,967); s. o
Dorchester (2435):—and for his **Red Rose** (15,343), 1 y., 4 m.,
s., Duke of Currypool (3096); d., Rosette (12,663); s. of d., Noblem
—A. C. Skinner, Pound Farm, Bishop's Lydeard, Somerset, **Lady**
13th of Pound (15,397), 1 y., 4 m., 5 d.; s., Masterpiece (2837)
Passmore 10th of Pound (13,606); s. of d., Duke of Pound 16th
and for his **Myrtle 54th of Pound** (15,400), 1 y., 2 m., 1 w.
Compensator (2942); d., Myrtle 44th of Pound (13,610); s. of
piece (2837):—and J. C. Williams, Caerhays Castle, St. Aust
12th May, 1896; s., Afterthought (3375); d., Blooming Cow 3rd
s. of d., Marmaduke (2280).

SHORTHORN.

Class 30.—*Shorthorn Bull, calved in* 1893 *or* 1894. [4 e

I. (£15.)—R. Stratton, The Duffryn, Newport, white, **Fl**
(65,527), 4 y., 2 w.; s., Field Officer (61,810); d., Timbrel 5th
Roan Seal (43,905).

II. (£10.)—G. Harrison, Gainford Hall, Darlington, roan, **B**
Chief, 4 y., 1 m., 3 w., 2 d., bred by Sir C. Tempest, Bart., Broug
s., Commanding Chief (62,315); d., Lady Whimsical 5th; s. of
Charming Land 35th (52,750).

R. & H. C.—R. Stratton, red, **Red Rube** (67,710), 3 y.,
s., Medallion (56,175); d., Rose of Duffryn; s. of d., Garnet (51,2

Class 31.—*Shorthorn Bull, calved in* 1895. [6 entri

I. (£15.)—J. D. Willis, Bapton Manor, Codford, Wilts, ro
Secret, 2 y., 3 w.; s., Royal Fame; d., Secrecy; s. of d., Colling

II. (£10.)—P. L. Mills, Ruddington Hall, Nottingham, roan,
(69,068), 2 y., 3 m., 2 w., 4 d., bred by W. Duthie, Tarves, Ab
Scottish Archer (59,893); d., Missie 118th; s. of d., William
(50,697).

III. (£5.)—G. Harrison, Gainford Hall, Darlington, roa
Archer, 2 y., 1 m., 1 w., 3 d., bred by W. Duthie, Collynie, Ta
s., Scottish Archer (59,893); d., Bright Bell; s. of d., Leon (49,8

R. & H. C.—G. F. King, Elm Park, Chewton Keynsham, Br
Cornelius (68,405, 1 y., 11 m., bred by J. D. Willis; s., Roan Robi
d., Empress Cinderella; s. of d., Wilkins Meabar (56,768).

Class 32.—*Shorthorn Bull, calved in* 1896. [12 entr

I. (£15.)—J. D. Willis, Bapton Manor, Codford, Wilts, roa
Robin, 1 y., 4 m., 2 w., 2 d.; s., Roan Robin; d., Primrose
Golden Crown.

II. (£10.)—G. Harrison, Gainford Hall, Darlington, roan,
1 y., 4 m., 2 w., 4 d., bred by Lord Lovat, Beaufort Castle,
Proud Duke (59,713); d., Queen of Rothes 2nd; s. of d., Kn
(38,510).

III. (£3.)—S. W. Bennett, Wareham, Dorset, roan, **Prince**
1 y., 3 m., 3 w., 5 d., bred by J. Young, Rothwick; s., Al
(66,609); d., Rosetta 2nd (vol. xlii. p. 376); s. of d., Vice
(56,681).

R. & H. C.—H.R.H. the Prince of Wales, K.G., Sandringha d and little white, **Kildare,** 1 y., 2 m., 2 w., 5 d.; s., Red Rover (63,192); ., Killerby Queen 9th; s. of d., King Charles (51,462).

C.—P. L. Mills, Ruddington Hall, Nottingham, red, **Best of Archers,** y., 2 w., 4 d., bred by W. Duthie, Tarves, Aberdeen; s., Scottish Archer 59,893); d., Brenda; s. of d., Plantagenet (57,868).

Class 33.—*Shorthorn Cow, in-Milk or in-Calf, calved before* 1894. [9 entries.]

I. (£15.)—C. W. Brierley, Twyford, Brimfield, R.S.O., red and white, **Jewel 2nd** (vol. xl. p. 273, H.B.), 3 y., 9 m., 1 w., 4 d.; s., Rosedale George 63,235); d., Rosedale Jewel; s. of d., Martinet (59,455).

II. (£10.)—C. W. Brierley, roan, **Queen of Hearts** (vol. xl. p. 274, H.B.), 3 y., 10 m., 3 d.; s., Rosedale Referee (61,650); d., The Queen; . of d., Rufus (48,648).

III. (£3.)—H. T. Cookson, Sturford Mead, Warminster, Wilts, roan, **Zeal 74th,** 6 y., 5 d., bred by W. Fowler, The Hall Farm, Exton, Oakham; s., Royal Windsor (59,850); d., Zeal 36th; s. of d., M.C. (31,898).

R. & H. C.—W. Nicholson, Basing Park, Alton, red and white, **Honesty,** 8 y., 6 m., 1 w., 3 d., bred by G. Taylor, Stanton Prior; s., Hindlip 26th (54,434); d., Harmony; s. of d., Oxford Swell 10th (45,310).

Class 34.—*Shorthorn Heifer, in-Milk or in-Calf, calved in* 1894. [3 entries.]

I. (£15.)—G. Harrison, Gainford Hall, Darlington, red, **Rose Blossom,** 3 y., 2 m., 2 w., bred by S. Campbell, Tofthills, Kintore, N.B.; s., Clan Alpine (60,495); d., Roselint; s. of d., Gravesend (46,461).

Class 35.—*Shorthorn Heifer, calved in* 1895. [7 entries.]

I. (£10.)—J. D. Willis, Bapton Manor, Codford, Wilts, roan, **Bapton Daisy,** 2 y., 3 m., 3 w., 1 d.; s., Adolphus; d., Wilts Daisy; s. of d., Rising Star.

II. (£5.)—L. de Rothschild, Ascott Home Farm, Leighton Buzzard, roan, **Sittyton Bride,** 2 y., 4 m., 2 w.; s., Sittyton Pride; d., Flora 2nd; s. of d., Challenge Cup.

III. (£2.)—G. Harrison, Gainford Hall, Darlingford, roan, **Welcome,** 1 y., 7 m., 3 w., 3 d.; s., Champion Cup (65,240); d., Warfare; s. of d., First Consul (57,314).

R. & H. C.—R. Stratton, The Duffryn, Newport, white, **Llanfair,** 2 y.; s., White Flag; d., Llanwern; s. of d., Signet.

C.—H. T. Cookson, Sturford Mead, Warminster, Wilts, roan, **Rose of Summer,** 1 y., 9 m., 3 w., 1 d.; s. Scottish Laddie (66,301); d., Rose of Spring; s. of d., Moonstone (63,022).

Class 36.—*Shorthorn Heifer, calved in* 1896. [7 entries.]

I. (£7.)—G. Harrison, Gainford Hall, Darlington, roan, **Bessie Martin,** 1 y., 4 m., bred by Sir A. Grant, Bart., Monymusk, N.B.; s., Martin (64,407); d., Bess; s. of d., Patient (54,789).

II. (£5.)—L. de Rothschild, Ascott Home Farm, Leighton Buzzard, roan, **Florence 8th,** 1 y., 4 m., 3 d.; s., President; d., Florence 6th; s. of d., Quentin Durward.

III. (£2.)—J. D. Willis, Bapton Manor, Codford, Wilts, roan, **Sylvia,** 1 y., 4 m., 3 d.; s., Count Victor; d., Spicy 13th; s. of d., Masterstroke.

R. & H. C.—H.R.H. THE PRINCE OF WALES, K.G., Sandrin
Judith, 1 y., 3 w., 5 d.; s., Franklin (67,092); d., Juliet; s.
Garland 16th (64,323).

HEREFORD.

CLASS 37.—*Hereford Bull, calved in* 1893 *or* 1894. [2

I. (£15.)—J. H. ARKWRIGHT, Hampton Court, Leominster,
(18,040), 3 y., 3 m., 1 w., 3 d.; s., Rose Cross 2nd (14,865); d
(vol. xx. p. 179); s. of d., Conjuror (5264).

II. (£10.)—W. H. B. CAVE, Wall End, Monkland,
President (17,432), 4 y., 1 m., 3 w., 2 d., bred by late J. Cave
Monkland; s., Llynaven (6539); d., Lady Henry Croft (vol. x
s. of d., Sir Henry (11,700).

CLASS 38.—*Hereford Bull, calved in* 1895. [3 entr

I. (£15.)—J. H. ARKWRIGHT, Hampton Court, Leominster,
(18,486), 2 y., 2 m., 3 w., 2 d.; s., Good Cross (14,569); d.,
(vol. xxvi. p. 171); s. of d., Iroquois (7039).

II. (£10.)—T. FENN, Stonebrook House, Ludlow, **Downt
man,** 2 y., 3 m., 3 w., 5 d.; s. Launcelot (13,917); d., Spot;
Isaac (5598).

R. & H. C.—J. EDWARDS, Rhiwlas Farm, Titley, Herefordsl
tion, 2 y., 1 m., 2 d.; s., Gladstone (16,733); d., Spangle 4t
Wilton Grove (9428).

CLASS 39.—*Hereford Bull, calved in* 1896. [10 ent

I. (£15.)—A. E. HUGHES, Wintercott, Leominster, **Lonsdale**
3 w., 6 d.; s., Albion (15,027); d., Lofty 2nd; s. of d., Seabree

II. (£10.)—E. W. CADDICK, Caradoc, Ross, **Royal Caradoc**
2 w., 1 d.; s., Blagdon (16,548); d., Rosa; s. of d., President (1

III. (£3.)—EARL OF COVENTRY, Croome Court, Worces
Cross, 1 y., 3 m., 3 w., 3 d.; s., Grandison (17,296); d., Gretch
Rare Sovereign (10,499).

R. & H. C.—R. GREEN, The Whittern, Lyonshall, H
Whittern Monarch, 1 y., 4 m., 1 w., 4 d.; s., Gentle Boy (
Merry Maid; s. of d., Whittern Grove (10,843).

C.—Sir C. R. BOUGHTON, Bart., Downton Hall, Ludlow,
3 m., 3 w., 1 d.; s., Royalist 3rd (16,958); d., Coral (vol. x
s. of d., Sovereign (12,688):—and W. J. S. WHITE, Zeals, Wi
1 y., 2 m., 1 w., 2 d.; s., Zeals Lad (17,079); d., Miss Beatrice 2n
p. 702); s. of d., Lord Salisbury (12,297).

CLASS 40.—*Hereford Cow, in-Milk or in-Calf, calved be
First prize,* 15*l.*—*second,* 10*l.*—*third,* 3*l.*

[NO EXHIBIT.]

CLASS 41.—*Hereford Heifer, in-Milk or in-Calf, calved*
[2 entries.]

I. (£15.)—Col. R. BRIDGFORD, C.B., Newton, Kinnersley, **Lett**
shire, **Pimpernel,** 3 y., 1 m., 2 w., 2 d.; s., **Ardcarn (16,516)**
s. of d., Torro (7313).

II. (£10.)—J. Tudge, Duxmoor, Craven Arms, Salop, **Miss Gift,** 3 y., 4 m., 2 w., 3 d.; s., Silurian (16,693); d., Rubella; s. of d., Hartington.

Class 42.—*Hereford Heifer, calved in* 1895. [6 entries.]

I. (£10.)—A. E. Hughes, Wintercott, Leominster, **Bountiful,** 2 y., 4 m., 2 w.; s., Albion (15,027); d., Barbara 2nd; s. of d., Seabreeze (14,153).

II. (£5.)—Earl of Coventry, Croome Court, Worcester, **Grace,** 2 y., 3 m., 3 w.; s., Senator (14,896); d., Gretchen; s. of d., Rare Sovereign (10,499).

III. (£2.)—E. W. Caddick, Caradoc, Ross, **Caradoc Jewess,** 2 y., 1 m., 2 w., 6 d.; s., Blagdon (16,548); d., Caradoc Jewel; s. of d., President (14,036).

R. & H. C.—R. Green, The Whittern, Lyonshall, Herefordshire, **Cedar,** 2 y., 1 m., 3 w., 3 d.; s., Pioneer (16,269); d., Cornflower; s. of d., Whittern Grove (10,843).

C.—W. T. Barneby, Saltmarshe Castle, Bromyard, **Dreamlike,** 2 y., 2 m.; s., Ricochet (16,332); d., Daydream (vol. xxvii. H.H.B.); s. of d., Electric Spark (13,771):—and T. Fenn, Stonebrook House, Ludlow, **Downton Symmetry,** 2 y., 3 m., 3 w., 3 d.; s., Rupert (16,366); d., Silversocks; s. of d., Bourton (11,005).

Class 43.—*Hereford Heifer, calved in* 1896. [5 entries.]

I. (£7.)—A. E. Hughes, Wintercott, Leominster, **Wintercott Plum,** 1 y., 3 m., 3 w., 4 d.; s., Albion (15,027); d., Newtown Plum; s. of d., Rudolph (6660).

II. (£5.)—R. Green, The Whittern, Lyonshall, Herefordshire, **Ixia,** 1 y., 3 m., 3 w., 4 d.; s., Gentle Boy (16,074); d., Ivy; s. of d., Druid (5880).

R. & H. C.—Sir C. R. Boughton, Bart., Downton Hall, Ludlow, **Lady Betty,** 1 y., 1 m., 3 w., 4 d.; s., Royalist 3rd (16,958); d., Norah (vol. xxiv. p. 206); s. of d., Sovereign (12,688).

V. H. C.—J. Tudge, Duxmoor, Craven Arms, Salop, **Lady Rupert,** 1 y., 1 m., 2 w.; s., Rupert (16,366); d., Rubella; s. of d., Hartington.

C.—Col. R. Bridgford, C.B., Newton, Kinnersley, Letton, Herefordshire, **Winifred,** 1 y., 1 m., 3 w., 1 d.; s., Ardcarn (16,516); d., Cinderella; s. of d., Byron (13,656).

SUSSEX.

Class 44.—*Sussex Bull, calved in* 1893 *or* 1894. [3 entries.]

I. (£15.)—Earl of Derby, Birtley, Witley, Surrey, **Golden Rex** (1303), 3 y., 11 m., 2 w., 6 d.; s., Gladiator (1171); d., Golden Reeve (4602); s. of d., Goldfinder (821).

II. (£10.)—Sir F. A. Montefiore, Bart., Worth Park, Crawley, **Lord Oxeye 3rd,** 3 y., 2 m., bred by C. T. Lucas, Warnham Court, Horsham; s., Lord Oxeye (954); d., Bouncer 3rd (4202).

Class 45.—*Sussex Bull, calved in* 1895. [6 entries.]

I. (£15.)—P. F. R. Saillard, Buchan Hill, Crawley, Sussex, **Saracen 3rd** (1446), 2 y., 2 m.; s., Silversmith 2nd (1115); d., Cowslip 1st (3951); s. of d., Bedlam 3rd (660).

II. (£10.)—F. WARDE, Aldon, Addington, West Malling, **Aldon 2nd** (1415), 1 y., 7 m., 4 d.; s., Headley (1201); d., Aldon Cherry (6042); s. of d., Duke of Dorset (582).

III. (£5.)—EARL OF DERBY, Birtley, Witley, Surrey, **Gamecock** (1414), 2 y., 4 m., 3 w.; s., Lord Oxeye of Wantley (1070); d., Gladsome 3rd (4008); s. of d., Oxford 2nd (771).

R.—A. AGATE, Grandford House, Horsham, Sussex, **Prince John of Horsham** (1400); 2 y., 4 m., 2 w., 1 d.; s., Prince John (1261); d., Gentle 10th (4415); s. of d., Nobleman (707).

H. C.—A. AGATE, **Lord Oxeye of Northlands** (1466), 1 y., 9 m., 2 w., 4 d., bred by W. Renton, Hedgcocks, Warnham, Sussex; s., Lord Oxeye 2nd (1383); d., Bouncer 4th (5774); s. of d., **Nebraska** (1097):—and W. BELDAM, Lyminster, Arundel, **Abbot 2nd**, 2 y., 4 m., 1 w., 2 d.; s., The Abbot (1357); d., Eleanor (5298); s. of d., **Knight of Woodmancote** (962).

CLASS 46.—*Sussex Bull, calved in* 1896. [6 entries.]

I. (£15.)—P. F. R. SAILLARD, Buchan Hill, Crawley, Sussex, **George**, 1 y., 2 m., 2 w., 6 d.; s., Silversmith 2nd (1115); d., Phyllis (5663); s. of d., Sir John (851).

II. (£10.)—A. AGATE, Grandford House, Horsham, Sussex, **Goldlink of Horsham 2nd** (1465), 1 y., 2 m., 4 w., 2 d.; s., Goldlink (1099); d., Longley 3rd (5335); s. of d., Lord Oxeye (954).

III. (£3.)—P. F. R. SAILLARD, **Alfred**, 1 y., 1 m., 1 w., 4 d., bred by J. H. T. Broadwood, Lyne, Horsham, Sussex; s., Vickress (1364); d., Curly 3rd (6481); s. of d., Hardy Boy (686).

R. & H. C.—Sir F. A. MONTEFIORE, Bart., Worth Park, Crawley, **Sir Francis** (1496), 1 y., 2 m., 3 w.; s., Young Goldfinch (1388); d., Lady Dewberry (6892); s. of d., Drungewick 4th (878).

CLASS 47.—*Sussex Cow, in-Milk or in-Calf, calved before* 1894. *First prize*, 15*l.*—*second*, 10*l.*—*third*, 3*l.*

[NO ENTRY.]

CLASS 48.—*Sussex Heifer, in-Milk or in-Calf, calved in* 1894. [1 entry.]

I. (£15.)—EARL OF DERBY, Birtley, Witley, Surrey, **Carnation** (6494), 3 y., 2 w., 1 d.; s., Gladiator (1171); d., Cuckoo (5462); s. of d., Frank (997).

CLASS 49.—*Sussex Heifer, calved in* 1895. [3 entries.]

I. (£10.)—P. F. R. SAILLARD, Buchan Hill, Crawley, Sussex, **Maud** (6928), 2 y., 2 m., 2 w.; s., Silversmith 2nd (1115); d., **Cherry Tart** (5662); s. of d., Saracen (1032).

II. (£5.)—EARL OF DERBY, Birtley, Witley, Surrey, **Honey Royal** (6774), 2 y., 4 m., 2 w., 5 d.; s., Proud Prince (1249); d., **Honey Lass** (5851); s. of d., Lord Oxeye (954).

C.—A. AGATE, Grandford House, Horsham, Sussex, **Golden Gentility 4th** (6707), 1 y., 7 m., 3 w., 1 d.; s., Goldlink (1099); d., **Golden Gentility** (4945); s. of d., Golddust 11th (677).

CLASS 50.—*Sussex Heifer, calved in* 1896. [9 entries.]

. (£7.)—G. WARDE, Tutsham, West Farleigh, near Maidstone, **Tutsham arguerite,** 1 y., 1 m., bred by C. J. Lucas, Warnham Court, Horsham; s., rd Oxeye 2nd (1383); d., Linnet (5868); s. of d., Gondolier (1001).

II. (£5.)—H. PARTRIDGE, Castle Hill, Bletchingly, Surrey, **Gretchen,** y., 3 m., 3 w., 6 d., bred by E. Braby, Rudgwick, Sussex; s., Noble hnnie (1360); d., Geraldine (3733); s. of d., Eastbourne (539).

III. (£2.)—F. WARDE, Aldon, Addington, West Malling, Kent, **Aldon 'ilderness 1st,** 1 y., 4 m., 2 w., 6 d.; s., Headley (1201); d., Aldon ilderness (6059); s. of d., Walnut.

R. & V. H. C.—G. WARDE, **Gaiety Girl 2nd,** 1 y., 3 m., 2 w., 6 d.; Dog Rose (1086); d., Columbine 6th (4410); s. of d., Oxford Duke (708).

H. C.—A. AGATE, Grandford House, Horsham, Sussex, **Old Mayflower h** (7001), 1 y., 4 m., 2 w., 3 d.; s., Goldlink (1099); d., Old Mayflower 5th 340); s. of d., Ringley Knight (591):—EARL OF DERBY, Birtley, Witley, irrey, **Honey Glass,** 1 y., 4 m., 2 w.; s., Gladiator (1171); d., Honey **iss** (5851); s. of d., Lord Oxeye (954):—and for his **Berry's Pride,** 1 y., m., 1 w., 5 d.; s., Proud Prince (1249); d., Berry 12th (4835); s. of d., r John (851):—P. F. R. SAILLARD, Buchan Hill, Crawley, Sussex, **ewbush Amy,** 1 y., 3 m., 2 w., 2 d.; s., Silversmith 2nd (1115): d., **ılatea** 3rd (6006); s. of d., Lord Oxeye (954):—and for his **Bewbush May,** y., 2 m., 3 w., 5 d.; s., Silversmith 2nd (1115); d., Old Mayflower 4th 082); s. of d., Shirley (436).

JERSEY.

CLASS 51.—*Jersey Bull, calved in* 1893 *or* 1894. [7 entries.]

I. (£15.)—Miss GREENALL, Walton Hall, Warrington, brown grey, **ılden Baron** (2067), 3 y., 4 m., 1 d., bred by T. Mourant, Trinity, sey; s., Golden Pink (1491); d., Queen Lass (1179); s. of d., Eloquence 1).

II. (£10.)—DUKE OF MARLBOROUGH, Blenheim Palace, Woodstock, Oxon, k, **Hariff** (4872), 4 y., 1 w., 5 d., bred by Hon. Mrs. C. Howard, tchlands, Great Missenden, Bucks; s., Handtree; d., Hiawithia; s. of d., ıck King (3085).

II. (£5.)—H. MCCALMONT, M.P., Bishopswood, Ross, whole fawn, **stinction's Security,** 3 y., 2 w., 1 d., bred by Sir J. Blyth, Bart., rthwood, Stansted, Essex; s., Distinction's Pride (4060); d., Lady Safety l. v. p. 459); s. of d., Royal Khedive (2863).

R. & H. C.—Mrs. C. McINTOSH, Havering Park, Essex, fawn, **Mont llier** (5294, E.J.H.B.), 3 y., 1 m., 3 w., 2 d., bred by J. Pallot, Jersey; What's Wanted (1259); d., Duchess; s. of d., Sir Richard.

I. C.—Col. F. WILLAN, Thornhill Park, Bittern, brown, **Fearless,** 2 y., ı., 3 d., bred by J. P. Pirouel, St. Owen's, Jersey; s., Golden Lad (1242); Trinitaise (3447); s. of d., Queen's Boy (946).

CLASS 52.—*Jersey Bull, calved in* 1895. [18 entries.]

. (£15.)—F. FREEMAN THOMAS, Little Ratton, Willingdon, Sussex, dark n, **Buttertooth,** 2 y., 1 w., 4 d.; s., Butterfly; d., Harebell B.; s. of d., tin's Duke (3523).

II. (£10.)—J. R. Corbett, More Place, Betchworth, dark fawn, **Harry 4th,** 2 y., 1 m., 4 d.; s., Franciscan; d., Harebell A.

III. (£5.)—Lord Rothschild, Tring Park, Tring, dark bronze, **Alicante's Boy,** 1 y., 8 m., 1 w., 4 d.; s., Flora's Lad (4098); d., Alicante (vol. vii. p. 175); s. of d., Count Wolseley (3191).

R. & V. H. C.—M. Marcus, High Trees, Redhill, brown, **Outlander,** 1 y., 10 m., 6 d.; s., Woodville Pride (5446); d., Vanille; s. of d., William Tell (1683).

H. C.—W. Mc. K. Bradley, Leylands, Meopham, Kent, whole, **Flora's Champion,** 2 y., 1 m., 1 w., 3 d., bred by Mrs. E. E. Starkie, The Mitchells, Saffron Walden, Essex; s., Gronfille's Lad (5197); d., Flora's Pearl; s. of d., Standard (3825):—Earl Cadogan, K.G., Culford Hall, Bury St. Edmunds, light fawn, **Spartan,** 2 y., 4 w., 2 d., bred by Lord Rothschild; s., Songster; d., Spot:—and Mrs. C. M. Perkins, Oakdene, Holmwood, Surrey, grey, **Grey Duke,** 1 y., 11 m., 2 w., 4 d., bred by J. Pallot, Montpellier Farm, Trinity, Jersey; s., Golden Sea (1961, J.H.B.); d., Ventnor 2nd (5691, J.H.B., P.S.); s. of d., What's Wanted (1259, J.H.B.).

C.—W. G. Skinner, Fullbrooks, Worcester Park, Surrey, **Applause,** 1 y., 9 m., 2 w., bred by J. Alexander, St. Owen's, Jersey; s., La Chasse Prince (1927); d., Brookhill Rose 3rd (4317, C.P.S.); s. of d., Trial 2nd (1474, C.P.S.):—and Miss Standish, New Park, Brockenhurst, Hants, dark grey, **Perry Farm Style,** 1 y., 8 m., 3 w., 5 d., bred by P. Blanche, St. Owen's, Jersey; s, Golden Lad (3324); d., Frugal 4th (5919); s. of. d., Lowland King (4616).

Class 53.—*Jersey Bull, calved in* 1896. [27 entries.]

I. (£15.)—Lord Rothschild, Tring Park, Tring, Herts, fawn, **Wigton's Cicero,** 1 y., 1 m., 1 w., 1 d.; s., Cicero (4796); d., Wigton 2nd (vol. v. p. 750); s. of d., Count Wolseley (3191).

II. (£10.)—H. McCalmont, M.P., Bishopswood, Ross, whole, **Rome,** 1 y., 5 d.; s., Caligula (4497); d., Science 2nd (vol. vi. p. 545); s. of d., Golden Lad (3324).

III. (£3.)—F. Freeman Thomas, Little Ratton, Willingdon, Sussex, fawn, **Melbourne,** 1 y., 1 m., 5 d.; s., Woolloomooloo; d., Harebell B.; s. of d., Martin's Duke (3520).

IV. (£2.)*—Lord Rothschild, fawn, **Oxford Baronet,** 1 y., 1 w., 6 d.; s., Spot's Lad (4389); d., Oxford Lily (vol. vi. p. 450); s. of d., Count Wolseley (3191).

R. & V. H. C.—Col. W. A. Hankey, Beaulieu, near Hastings, dark fawn, **Beaulieu,** 1 y., 1 m., 4 d.; s., Grouville's Dairyman (4153); d., Pansey (vol. vi. p. 555); s. of d., Lord Ratton (3488).

H. C.—W. Alexander, jun., Les Marais, St. Mary's, Jersey, dark grey, **Duster,** 1 y., 1 w., 2 d., bred by T. Binet, St. Martin's, Jersey; s., Golden Sea (1961, H.C., J.H.B.); d., Finistère (5445, J.H.B.); s. of d., Lord Primrose (1500, J.H.B.):—W. Mc. K. Bradley, Leylands, Meopham, Kent, whole, **Leyland's Champion,** 1 y., 2 w., 5 d.; s. Gronfille's Lad (5197); d., Lady Lavinia 5th; s. of d., Everton King 7th (3254):—Col. W. A. Hankey, dark fawn, **Duke of York,** 1 y., 1 m., 2 d.; s., Grouville's Dairyman (4153); d., Young Queen 4th (E.J.H.B., vol. vii. p. 226); s. of d., Biron (1375, J.H.B.):—Mrs. C. McIntosh, Havering Park, Essex, brown, **King**

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* Specially recommended by the Judges.

arden (J.H.B.), 1 y., 3 m., 2 d., bred by P. Varden, St. Martin's, Jersey; Eminent (1842, J.H.B.); d., Violette (3942, J.H.B.); s. of d., Standard 056, J.H.B.) :—and R. J. Pope, J.P., Beresford Manor, Plumpton, Sussex, ole, **Taurus Beresford,** 7 m., 2 w., 3 d.; s., Golden Lad (1242); d., resford Regina; s. of d., Lowland King (1673).

C.—Earl Cadogan, K.G., Culford Hall, Bury St. Edmunds, fawn, **Besse-er,** 10 m., 2 w., 6 d.; s., Nevado; d., J. B. Bess :—C. F. Dixon, Lymore House, ursling, Southampton, dark grey, **Trumps,** 1 y., 1 m., 2 w., bred by J. . Michel, Beaumont, St. Peter's, Jersey; s., Badier Fair (2042); d., Pansy 100) :—Duke of Marlborough, Blenheim Palace, Woodstock, Oxon, dark ey, **Ida Prince,** 1 y., 1 m., 3 w., 3d., bred by W. Alexander, St. Mary's, ersey; s., Curton Pride (2170); d., Ida (5562):—Duke of Northum-erland, K.G., Albury Park, Guildford, brown, **Syren's Prince,** 1 y., m., 3 w., bred by Ed. Le Feuvre, St. Owen, Jersey; s., La Chasse rince (1927); d., Syren (2025); s. of d., Golden Lad (1242):—R. J. Pope, .P., whole, **Lord William Beresford,** 11 m., 3 w.; s., Devotion's Lad; ., Lady Beresford; s. of d., Distinction's Pride (1486) :—and Col. T. Shaw-ellier, Womburne Wodehouse, Wolverhampton, whole, **Dairyman,** bred y W. J. Lobey, Grouville, Jersey; s., Lord Carteret (2064); d., Fontaine 4th 537).

Class 54.—*Jersey Cow, in-Milk or in-Calf, calved before* 1894.

[27 entries.]

I. (£15.)—Lord Rothschild, Tring Park, Tring, Herts, fawn, **Gipsy ueen 2nd** (vol. vii. p. 202); 5 y., 3 m., 3 w., 5 d., bred by J. Falle, St. artin's, Jersey; s., Golden Lad (3324); d., Gipsy Queen (440, J.J.H.B.); of d., Pretender (1900).

II. (£10.)—Miss Greenall, Walton Hall, Warrington, brown, **Sweet yes** (4935), 5 y., 5 m., 4 w., bred by W. Jean, Trinity, Jersey; s., Golden ad (1242); d., Fidélite's Beauty (7499).

III. (£3.)—R. J. Pope, J.P., Beresford Manor, Plumpton, Sussex, whole, **eresford Queen,** 5 y., 2 m., 2 w., bred by J. Arthur, Jersey; s., Golden ad (1242); d., Orphan 2nd.

R. & V. H. C.—Lord Rothschild, brown, **Dairy Golden** (5183, J.H.B., H.C.), 5 y., 5 m., 2 w., 5 d., bred by W. J. Labey, Grouville, ersey; s., Golden Lad (3324); d., Darkey's Dairy Pride (1186, J.J.H.B.).

V. H. C.—W. Mc. K. Bradley, Leylands, Meopham, Kent, whole brown, **olden Chance,** late **White Rose,** 5 y., 9 m., 1 w., 5 d., bred by C. uesuel, Jersey; s., Golden Lad (3324); d., Homely (2382):—and for his hole, **Beresford Gift,** 4 y., 4 w., bred by A. P. Lempriere, St. Saviour's, ersey; s., Fortescue 5th (4104); d., Carita (1390, P.S.C.); s. of d., Aster Boy 192) :—and H. McCalmont, M.P., Bishopswood, Ross, whole fawn, **Sweet onder 2nd,** 5 y., 1 m., 1 w., 1 d.; s., Casina (1449, I.H.B.); d., Sweet onder (4163, I.H.B.); s. of d., Rosy's Wonder (835).

H. C.—Sir J. Blyth, Bart., Blythwood, Stansted, Essex, fawn, **Belle ionne,** 8 y., 6 m., 1 w., 2 d., bred by T. Smith, Jersey; s., Count Bismarck 23, I.H.B.); d., La Lionne (1245); s. of d., Napoleon (2697):—and for is fawn, **Tenby,** 6 y., 3 w., 2 d., bred by J. Touzel, Jersey; s., Golden ad (1242, I.H.B.); d., Texas (2205, I.H.B.) :—Miss Greenall, **Mona 10th** 254), 3 y., 6 m., 2 w., 6d., bred by F. P. Hacquoil, Jersey; s., Golden ad (1242); d., Mona 8th (3983) :—and R. J. Pope, J.P., whole, **Beresford ride,** 3 y., 9 m., 4 d., bred by M. Le Gallais, Jersey; s., Orme (1660); d., urtle Dove (4354); s. of d., John Browne (1229).

C.—J. R. Corbett, More Place, Betchworth, fawn, **Bessie 7th,** 5 y., 3 m., 2 w.; s., Franciscan; d., Bessie 4th:—Miss Greenall, fawn, **Golden Mona,** 4 y., 2 w., 4 d., bred by Sir G. Greenall, Bart., Walton Hall, Warrington; s., Golden Lad (1242); d., Mona 7th (3694); s. of d., Leonidas (881):—Duke of Marlborough, Blenheim Palace, Woodstock, Oxon, broken colour, **Honeymoon,** 4 y., 1 m., 2 w., 1 d., bred by H. C. Smith, Mount Clare, Roehampton, Surrey; s., Ducat (4072); d., Cynthia; s. of d., La Ferrierie's King (2587):—Mrs. C. M. Perkins, Oakdene, Holmwood, Surrey, light fawn, **Reef 2nd,** 5 y., 3 w., bred by Lord Braybrooke, Audley End, Essex; s., Old Port (3600); d., Reef (vol. vi. p. 505); s. of d., Milkman (3545):—and Mrs. C. McIntosh, Havering Park, Essex, brown, **Jersey Lily 2nd** (4812, J.H.B.), 6 y., 3 m., 2 w., 3 d., bred by W. Alexander, St. Mary's, Jersey; s., Rosy's Wonder (835, J.H.B.); d., Jersey Lily (1628, J.H.B.); s. of d., Baron 2nd (428, J.H.B.).

Class 55.—*Heifer, in-Milk or in-Calf, calved in* 1894.

[21 entries.]

I. (£15.)—Lord Rothschild, Tring Park, Tring, Herts, grey fawn, **Bangle,** 3 y., 2 m., 3 w., 5 d., bred by J. E. Baudains, St. Peter's, Jersey; s., Skinner (J.J.H.B., 1620); d., St. John's Twist (J.J.H.B., 6798).

II. (£10.)—Lord Rothschild, dark fawn, **Cherry,** 2 y., 11 m., bred by J. C. Le Sueur, Grouville, Jersey; s., Nunthorpe (4648); d., Cherry Belle (J.J.H.B., 7791).

III. (£8) and Special.*—Duke of Marlborough, Blenheim Palace, Woodstock, Oxon, grey, **Distinction's Snowflake,** 3 y., 3 w., 1 d., bred by Sir J. Blyth, Blythwood, Stansted, Essex; s., Distinction's Pride (4060); d., Snowflake 4th; s. of d., Everton King (1565).

R. & V. H. C.—Mrs. C. McIntosh, Havering Park, Essex, fawn, **Glorissa 3rd** (6169, H.C., J.H.B.), 2 y., 11 m., 3 w., bred by A. Marguirie, Jersey; s., Silver Grey (1805, J.H.B.); d., Glorissa 2nd (4989, J.H.B.); s. of d., Elderly 2nd (1393, J.H.B.).

H. C.—W. Alexander, jun., Les Marais, St. Mary's, Jersey, fawn, **Daisy,** 3 y., 3 m., 3 w., bred by J. Gallois, St. Saviour's, Jersey; s., Otter (1861. H.C., J.H.B.); d., Madame Eiffel (3608, H.C., J.H.B.); s. of d., Fauvie's Trifle (1010, J.H.B.):—Miss Greenall, Walton Hall, Warrington, brown, **Happy 3rd.,** 3 y., 2 m., 2 w., 6 d., bred by A. le Goubey, St. Lawrence, Jersey; s., Tudor (1682); d., Happy (4608):—and for her fawn and white, **White Mona,** 3 y., 4 w., bred by Sir G. Greenall, Bart., Walton Hall, Warrington; s., Golden Lad (1242); d., Mona 5th (2619); s. of d., Lily's Prince (681):—and R. J. Pope, J.P., Beresford Manor, Plumpton, Lewes, Sussex, whole, **Superba Beresford,** 2 y., 5 m., 2 w., 6 d., bred by F. Becquet, Jersey; s., Golden Lad (1242); d., Garantie (7226).

C.—W. Mc. K. Bradley, Leylands, Meopham, Kent, whole brown, **White Silk,** 2 y., 5 m., 3 w., bred by Mrs. Perkins, Oakdene, Holmwood, Surrey; s., Harry Lynx (4171); d., White Stockings; s. of d., Butterfly (4006):—H. McCalmont, M.P., Bishopswood, Ross, whole fawn, **Whisper,** 2 y., 10 m., 1 w., 5 d., bred by Mrs. A. F. Perkins, Oakdene, Holmwood, Surrey; s., Harry Lynx (4171); d., Wigton (vol. vi. p. 630); s. of d., Egypt Lad (2414):—A. E. McMullen, Vale House, Hertford, dark fawn, **Mignonette's Pet,** 2 y., 5 m., bred by P. P. Du Few, St. Mary's, Jersey; s.,

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* Given by Sir James Blyth, Bart., the Blythwood Challenge Silver Bowl, weighing 25 ounces, for the Best Jersey Cow or Heifer in-Milk, in any of the Jersey Classes, bred in Great Britain or Ireland, to be awarded by inspection.

Golden Lad (1242); d., Mignonette (2847); s. of d., Lily's Prince (681):—and Mrs. C. M. Perkins, Oakdene, Holmwood, Surrey, fawn and white, **Soubrette 2nd,** 3 y., 1 m., 3 w., 1 d.; bred by G. J. Skelton, St. Mary's, Jersey; s., Golden Lad (1242); d., Soubretto (J.H.B 2242); s. of d., Emperor 3rd (J.H.B., 635, H.C.).

Class 56.—*Jersey Heifer, calved in* 1895. [34 entries.]

I. (£10.)—W. Alexander, jun., Les Marais, St. Mary's, Jersey, light fawn, **Prolific,** 2 y., 1 w., 6 d., bred by E. Esnouf, St. Mary's, Jersey; s., Melton (2028, J.H.B.); d., Suspect 5th (5122, J.H.B.); s. of d., Royal Boy (1541, J.H.B.).

II. (£5.)—Mrs. C. McIntosh, Havering Park, Essex, brown, **Snap Buttercup 3rd** (J.H.B.), 2 y., 3 m., 4 w., 1 d., bred by W. Alexander, St. Mary's, Jersey; s., Rob Roy (1749, J.H.B.); d., Snap Buttercup 2nd (3383, J.H.B.); s. of d., Duc de Chambord (580, J.H.B.).

III. (£2) and Extra Local **(£10.)***—C. F. Dixon, Lymore House, Nursling, Southampton, grey brown, **Elgitha,** 2 y., 2 m., 2 w., 1 d., bred by J. T. Falle, The Elms, St. Mary's, Jersey; s., Golden Lad (1242); d., Melvina 2nd (1905).

R. & V. H. C.—Miss Greenall, Walton Hall, Warrington, brown, **Young Lady,** 2 y., 1 m., 2 w., 2 d., bred by Les Journeaux, St. Saviour's, Jersey; s., Result's Prince (2004); d,, Lady (4328).

V. H. C. & R. for Special.†—Lord Rothschild, Tring Park, Tring, Herts, fawn, **Oxford Daylight** (Reg. vii. p. 82), 2 y., 1 m., 2 m., 2 d.; s., Songster (4710); d., Oxford Dawn (vol. vi. p. 450); s. of d., Pioneer (4311).

V. H. C.—H. McCalmont, M.P., Bishopswood, Ross, whole fawn, **Faux Pas,** 2 y., 2 m., 3 d.; s., Orange Peel (4702); d., Scarsdale Florida (vol. v. p. 664); s. of d., Marmalade (3515).

H. C. and **R.** for Extra Local.*—W. M. Harvey, Allington Manor Farm, Bishopstoke, fawn, **Leda,** 2 y., 2 m., 1 w., 2 d., bred by J. E. Baudains St. Helier's, Jersey; s., Skinner (1620, J.H.B.); d., Bandraft 3rd (4524 J.H.B.).

H. C.—W. Alexander, jun., brown and white, **Wilful,** 2 y., 3 m., 6 d., bred by R. J. Arthur, Grouville, Jersey; s., Lord Maitland (1964, H.C., J.H.B.); d., Woodville Beauty (7536, J.H.B.):—Earl Cadogan, K.G., Culford Hall, Bury St. Edmunds, fawn, **Besika,** 1 y., 10 m., 2 w., 5 d.; s., Nevada; d., J. G. Bess:—J. R. Corbett, More Place, Betchworth, fawn, **Beauty,** 2 y., 3 d.; s., Little Goldie; d., Bessie 7th:—Fowler and De la Perrelle, Southampton, fawn, **Rosecomb** (F. 101, J.H.B.); 2 y., 3 m., 2 w., 2 d., bred by P. Poignand, Jersey; s., Woodville Pride (1994, J.H.B.); d., Pastille (2855, J.H.B.):—Miss Greenall, fawn, **Agate,** 2 y., 3 w., 5 d., bred by Sir G. Greenall, Bart., Walton Hall, Warrington; s., Little Gem (4607); d., Longueville Brownie (vol. vi. p. 354); s. of d., Trial (1187):—and for her fawn, **Queen Bee,** 2 y., 2 m., 2 w., 2 d.; bred by A. Jouanne, Trinity, Jersey; s., Valial (1928); d., Benne (7568):—A. E. McMullen, Vale

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* Given by the Southampton Local Committee for Best Entry in Class 55 or 56, the property of a resident within a radius of ten miles from the Bargate, Southampton.

† Given by Sir James Blyth, Bart., the Blythwood Challenge Silver Bowl, weighing 25 ounces, for the Best Jersey Cow or Heifer in-Milk, in any of the Jersey Classes, bred in Great Britain or Ireland, to be awarded by inspection.

House, Hertford, fawn, **Golden Cream 3rd** (P.S.), 2 y., 1 m., 3
T. Vibert, St. Owen's, Jersey; s., Tambour (1872); d., Golden C
F.S.):—and R. J. Pope, J.P., Beresford Manor, Plumpton, Le
whole, **Ophelia Beresford,** 2 y., 3 w., 4 d.; s., Golden Hero
Rosy (2156).

C.—W. Alexander, jun., brown, **Lady Harrogate 13th,**
5 d., bred by R. J. Arthur; s., Mabel's Prince (2005, J.H.B.)
Harrogate 8th (5151, J.H.B.); s. of d., Strawberry (1578, J.H.
Cadogan, K.G., fawn, **Golden Legend,** 2 y., 1 m., 4 w.; s., G
(4557); d., Fancy's Beauty:—and C. F. Dixon, grey, **Little**
1 m., 1 w., 1 d., bred by J. T. Michel, Beaumont, St. Peter's,
Woodville Pride (1994); d., Pearl (5299).

Class 57.—*Jersey Heifer, calved in* 1896. [44 entr

I. (£7.)—Lord Rothschild, Tring Park, Tring, Herts, fawn,
5th, 1 y., 1 m., 2 w., 3 d.; s., Cicero (4796); d., Clemence 2
p. 108); s. of d., Golden King (3323).

II. (£5.)—Miss Greenall, Walton Hall, Warrington, fawn,
10 m., 1 w., 5 d., bred by Sir G. Greenall, Bart., Walton Hall,
s., Uncle Peter (2115); d., Rioto.

III. (£2.)—W. Barron, Taplow House, Bucks, fawn, **P**
1 y., 2 w.; s., Dora's Champion (5142); d., Phyllis 2nd; s.
of the Isles (4612).

IV. (£1.)*—Sir J. Blyth, Bart., Blythwood, Stansted, Essex,
tinction's Snowflake 2nd, 1 y., 3 m., 1 w., 1 d.; s., Distin
(4060); d., Snowflake 4th; s. of d., Everton King (1565).

R. & V. H. C.—R. J. Pope, J.P., Beresford Manor, Plump
whole, **Dede Beresford,** 1 y., 1 m., 2 w., 6 d.; s., Devotio
Lady Durist; s. of d., Golden Lad.

V. H. C.—F. Freeman Thomas, Little Ratton, Willingd
fawn, **Heartsease,** 9 m., 3 w., 1 d.; s., Woolloomooloo;
s. of d., Cloth of Gold.

H. C.—W. Mc. K. Bradley, Leylands, Meopham, Kent, faw
Convent 3rd, 1 y., 1 m., 4 d., bred by J. Arthur, St. Mary's,
Golden Pasha (2154); d., Belle du Convent 2nd (5625):—Ear
K.G., Culford Hall, Bury St. Edmunds, broken colour, **Golden S**
4 w., 3 d.; s., Golden Fluke; d., Sunbeam:—H. McCalmont, M
wood, Ross, whole, **State Secret,** 1 y., 1 w.; s., Havering B
Whisper (vol. vi. p. 630); s. of d., Harry Lynx (4171):—Lord
fawn, **Oxford Violet,** 1 y., 1 m., 4 d.; s., Cicero (4796);
Daffodil (vol. vi. p. 450); s. of d., Nunthorpe (4648):—and for
Carteret Duchess, 1 y., 1 m., 1 w.; s., Lord Carteret (2064
d., Brown Duchess of Carteret (4722, H.C., J.J.H.B.); s. of d.,
(3324):—and F. Freeman Thomas, light fawn, **Heather 2**
3 w.; s., Woolloomooloo; d., Heather; s. of d., Little Demon.

C.—Sir J. Blyth, Bart., fawn, **Lady of Distinction,** 1 y., 2 m
s., Distinction's Pride (4060); d., Lady Hamilton; s. of d.,
(4378):—Capt. A. B. S. Fraser, West Tarring Farm, Worthi
and white, **Magpie's Duchess,** 11 m., 3 w., 6 d.; s., Perry
(5327); d., Perry Farm Magpie (8266, I.H.B., F.S., H.C.):
Tyntesfield, Bristol, dark fawn, **Lady Blanch,** 4 m., 3 w., 6 d.;

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* Specially recommended by the Judges.

d., Kitty's Pet; s. of d., Kaiser's Prince (3420):—W. A. HANKEY, Beaulieu, near Hastings, light fawn, **Lucilla**, 8 m., 3 w., 3 d.; s., Golden Spur (5184); d., Ruby (vol. vi. p. 553); s. of d., Grouville's Dairyman:—Mrs. C. MCINTOSH, Havering Park, Essex, brown, **Little Daisy** (J.H.B.), 1 y., 2 w., 3 d., bred by W. Alexander, St. Mary's, Jersey; s., Lord Chancellor (2060, J.H.B.); d., Belle Rosa 3rd (5623, J.H.B.); s. of d., Golden Lad (1242, J.H.B.):—Mrs. C. M. PERKINS, Oakdene, Holmwood, Surrey, fawn, **Wellingtonia**, 11 m., 3 w., 3 d.; s., Fame's Duke (5161); d., Wigton; s. of d., Egypt Lad (665, I.H.B., P.S.C.):—R. J. POPE, J.P., whole, **Victoria Beresford**, 1 y.; s., Great Scot (2153); d., Saucy Beresford; s. of d., Lowland King:—Col. F. WILLAN, Thornhill Park, Bitterne, whole, **Truelove**, 1 y., 1 m., 2 w., 4 d.; s., Birthright (3084); d., Truthful (vol. vi. p. 604); s. of d., Gaverock (3307):—and for his whole, **Hilda**, 1 y., 1 m., 5 d.; s., Birthright (3084); d., Hermione.

GUERNSEY.

CLASS 58.—*Guernsey Bull, calved in* 1893 *or* 1894. [4 entries.]

I. (£15.)—Hon. Mrs. A. B. HAMILTON, Sheldons, Hook, Winchfield, fawn and white, **Royal Squire 2nd of L'Etiennerie**, 3 y., 6 m., 2 w., bred by T. Le Prévost, L'Etiennerie Castel, Guernsey; s., Lord Mortimer 2nd (743, R.A.S.); d., Lady Cora 4th (1475, R.A.S.); s. of d., Ransom 2nd (204 R.A.S.).

II. (£10.)—V. WILLETT, Apse Manor, Shanklin, Isle of Wight, orange fawn and white, **Frolic 5th** (612, E.G.H.B.), 4 y., 1 m., 2 w., 4 d., bred by W. A. Glynn, Seagrove, Sea View, Isle of Wight; s., The General (444, E.G.H.B.); d., Frisky (357, E.G.H.B.).

R. & V. H. C.—W. A. GLYNN, Seagrove, Sea View, near Ryde, Isle of Wight, orange and white, **Hopeful 7th** (780, E.G.H.B.), 2 y., 8 m., 3 w., 3 d.; s., Moscow (492, E.G.H.B.); d., Amelia (1223, E.G.H.B.).

CLASS 59.—*Guernsey Bull, calved in* 1895. [10 entries.]

I. (£15.)—Sir F. A. MONTEFIORE, Bart., Worth Park, Crawley, fawn and white, **Professor** (1004, R.G.A.S.), 2 y., 4 m., 3 w., bred by T. Richet, Vale, Guernsey; s., Surprise of the Capelles (818, R.G.A.S.); d., Bonne Aventure 2nd (898, R.G.A.S.).

II. (£10.)—W. H. FOWLER, Claremont, Taunton, orange and white, **Claremont Dr. Jim**, 1 y., 11 m., 6d., bred by D. de Moulpied, Ville au Roi, Guernsey; s., Noble Boy (822, P.S., R.G.H.B.); d., Fairy of the Ville au Roi (1463, P.S., R.G.H.B.).

III. (£5.)—J. H. HOWARD, Goldenhayes, Bartley, Totton, Hants, red and white, **King Alfonso 2nd**, 1 y., 10 m., 2 w., 2 d., bred by J. Tostevin, Eclet, St. Peter's, Guernsey; s., Safeguard of the Capelles (914, P.S., R.G.A.S.); d., Lady de Saumarez (740, P.S., R.G.A.S.).

R. & V. H. C.—W. A. GLYNN, Seagrove, Sea View, near Ryde, Isle of Wight, orange fawn and white, **Hopeful 8th** (781, E.G.H.B.), 1 y., 11 m., 3 w., 2 d.; s., Frolic 5th (612, E.G.H.B.); d., Favourite 15th (2140, E.G.H.B.).

V. H. C.—E. A. HAMBRO, Hayes Place, Hayes, Kent, red and white, **Amphion**, 1 y., 9 m., 2 w., bred by J. Stephens, Finchley; s., May Boy; d., Muriel; s. of d., Climax:—and Hon. Mrs. A. B. HAMILTON, Sheldons, Hook, Winchfield, Hants, fawn and white, **Achilles**, 2 y., 3 m., 2 w.

CLASS 60.—*Guernsey Bull, calved in* 1896. [12 entries.]

I. (£15.)—H. C. Stephens, M.P., Avenue House, Finchley, fawn and white, **Caractacus**, 1 y., 3 m., 1 w., 5 d.; s., Ambassador (656); d., Citron Blossom 9th (2387).

II. (£10.)—W. A. Glynn, Seagrove, Sea View, Isle of Wight, orange, fawn and white, **Frolic 6th** (899, E.G.H.B.), 1 y., 2 m., 3 w., 3 d.; s., Frolic 5th (612, E.G.H.B.); d., Favourite 10th (1288, E.G.H.B.).

III. (£3.)—W. H. Fowler, Claremont, Taunton, red and white, **Claremont Lord Roberts**, 1 y., 3 m., 1 w., 5 d., bred by J. Mahy, St. Sampson's, Guernsey; s., Safeguard of the Capelles (914, P.S., R.G.H.B.); d., Sweet Lily (1977, F.S., R.G.H.B.).

R. & V. H. C.—H. J. Gibbs, Milford, Salisbury, fawn and white, **Petersfinger**, 1 y., 2 w., 6 d.; s., Nobleman (634, E.G.H.B.); d., Polly des Paysans (2278, E.G.H.B.).

V. H. C.—V. Willett, Apse Manor, Shanklin, Isle of Wight, orange, fawn and white, **Frolic 7th** (900, E.G.H.B.), 1 y., 1 m., bred by W. A. Glynn, Seagrove, Sea View, Isle of Wight; s., Frolic 5th (612, E.G.H.B.); d., Favourite 13th (1852, E.G.H.B.).

H. C.—E. A. Hambro, Hayes Place, Hayes, Kent, fawn and white, **Hayes Starlight**, 1 y., 1 m., 1 w.; s., Starlight; d., Vesta 44th; s. of d., Magnus 4th.

CLASS 61.—*Guernsey Cow, in-Milk or in-Calf, calved before* 1894. [14 entries.]

I. (£15.)—Sir F. A. Montefiore, Bart., Worth Park, Crawley, fawn and white, **Silvester** (2894), 5 y., 11 m., 3 w., bred by M. M. Laine, St. Saviour's, Guernsey; s., Captain (513, R.G.A.S.); d., Silvester 2nd (155, R.G.A.S.).

II. (£10.)—J. Stephens, Grove House, Finchley, pale red and white, **Muriel 4th** (1984), 5 y., 7 m., 2 w.; s., May Boy (346); d., Muriel (1132).

III. (£3.)—W. A. Glynn, Seagrove, Sea View, Isle of Wight, orange fawn and white, **Favourite 11th** (1288, E.G.H.B.), 8 y., 9 m., 1 w., 2 d.; s., Hopeful (25, E.G.H.B.); d., Favourite 6th (355, E.G.H.B.).

R. & V. H. C.—W. H. Fowler, Claremont, Taunton, red and white, **Claremont Sweet Marjorie**, 6 y., 1 m., 1 w., 3 d., bred by Le Pordevin, Vale, Guernsey.

V. H. C.—J. C. Forster, Clatford Mills, Andover, fawn and white, **Annette**, 11 y., 7 m., 1 w., 5 d., bred by Col. Shakerley, Fairlight, Hastings; s., Andros (134, R.G.H.B., P.S.); d., Valerie (950, E.G.H.B.).

H. C.—E. A. Hambro, Hayes Place, Hayes, Kent, red and white, **Rose of the Ville Amphrey 3rd**, 4 y., 1 m., 3 w., 3 d., bred by J. Rose, Ville Amphrey, St. Martin's; s., Amateur; d., Rose of the Ville Amphrey:—Sir F. A. Montefiore, Bart., fawn and white, **Fair Valentine 2nd** (2414), 3 y., 9 m., 3 w., 3 d., bred by H. C. Stephens; s., May Boy (346, R.G.A.S.); d., Fair Valentine (1554, R.G.A.S.):—and J. Stephens, fawn and white, **Camelia of Guernsey**, 7 y., 1 m., bred by H. Gandion, St. Sampsons; s., Lord Strangford (234); d., Daisy.

CLASS 62.—*Guernsey Heifer, in-Milk or in-Calf, calved in* 1894. [8 entries.]

I. (£15.)—Hon. Mrs. A. B. Hamilton, Sheldons, Hook, Winchfield, red fawn, **Florence 6th**, 3 y., 2 m., 2 w., 4 d.

II. (£10.)—J. C. Forster, Clatford Mills, Andover, red and white, **Flora d'Aval 7th,** 3 y., 1 m., 2 w., 4 d., bred by J. Jainé, Hougues, St. Sampson's; s., Surprise of the Capelles; d., Flora d'Aval 3rd.

III. (£3.)—J. Stephens, Grove House, Finchley, Middlesex, orange, fawn and white, **Muriel 6th** (2765), 2 y., 5 m., 1 w.; s., Express (609); d., Muriel 4th (1984).

R. & V. H. C.—W. A. Glynn, Seagrove, Sea View, Isle of Wight, orange, fawn and white, **Jessica 4th** (3032, E.G.H.B.), 2 y., 11 m., 2 w.; s., Lord Moscow (698, E.G.H.B.); d., Jessica (379, E.G.H.B.).

V. H. C.—W. H. Fowler, Claremont, Taunton, red and white, **Claremont Cornflower,** 2 y., 8 m., 3 w., bred by F. G. Faode, Epinel, Guernsey; s., Mimic (787, R.G.H.B.); d., Rosette:—W. A. Glynn, fawn and white, **Tulip** (4805, E.G.H.B.), 3 y., 2 m., bred by W. le Ray, Galliennes, Guernsey; s., Safeguard; d., Tulip:—and Hon. Mrs. A. B. Hamilton, fawn and white, **Dog Violet,** 3 y., 2 m., 3 w., 1 d.; s., Sampson (269, E.G.H.B.); d., Wood Violet (2335, E.G.H.B.); s. of d., Consul.

Class 63.—*Guernsey Heifer, calved in* 1895. [15 entries.]

I. (£10.)—J. C. Forster, Clatford Mills, Andover, red and white, **Clatford Spot 4th,** 2 y., 1 m., 2 w., 6 d.; s., Jove (621, E.G.H.B.); d., Clatford Spot 2nd (2112, E.G.H.B.).

II. (£5.)—W. A. Glynn, Seagrove, Sea View, Isle of Wight, orange and white, **Favourite 19th,** 2 y., 4 d.; s., Tommy 4th (592, E.G.H.B.); d., Favourite 14th (2142, E.G.H.B.).

III. (£2.)—W. H. Fowler, Claremont, Taunton, fawn and white, **Claremont Ruth 6th,** 1 y., 11 m., 3 w., 3 d.; s., Roseberry (625, P.S., R.G.H.B.); d., Claremont Ruth (2918, E.G.H.B.).

R. & V. H. C.—W. A. Glynn, orange, fawn and white, **Favourite 20th** (2972), 1 y., 11 m., 4 d.; s., Frolic 5th (612); d., Favourite 10th (1287).

H. C.—Sir F. A. Montefiore, Bart., Worth Park, Crawley, fawn and white, **Lucy des Forgettes 4th** (3092), 2 y., 4 m.; s., Sir Francis 2nd (440); d., Lucy des Forgettes (13,792):—and for his fawn and white, **Zara 1st** (3556), 2 y., 4 m., 4 d., bred by J. le Page, Hill Farm, St. Andrew's, Guernsey; s., Merry Boy (876, R.G.A.S.); d., Zara (3471, R.G.A.S.).

Extra Local **(£10.)***—J. H. Howard, Goldenhayes, Bartley, Totton, Hants, red and white markings, **Frivolity** (2983, E.G.H.B.), 2 y., 2 m.; s., Signalman (585, E.G.H.B.); d., Fickleness (1855, E.G.H.B.); s. of d., Sentinel (270, E.G.H.B.).

R. for Extra Local.*—Fowler and De la Perrelle, Southampton, pale red and white, **Zelta du Long Frie 3rd** (4932, G.H.B.), 2 y., 4 m., bred by N. P. Tostevin, Long Frie, St. Peter's-in-the-Wood, Guernsey; s., Sir Winter; d., Zelta du Long Frie 2nd.

Class 64.—*Guernsey Heifer, calved in* 1896. [25 entries.]

I. (£7.)—J. Stephens, Grove House, Finchley, Middlesex, fawn and white, **Camelia of Guernsey 3rd,** 1 y., 2 m., 3 w.; s., Cholderton Beau (604); d., Camelia of Guernsey (2103).

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* Given by the Southampton Local Committee for Best Entry in Class 62 or 63, the property of a resident within a radius of ten miles from the Bargate, Southampton.

II. (£5.)—Sir F. A. Montefiore, Bart., Worth Park, Crawley, fawn and white, **Lucy des Forgettes 6th** (3453), 1 y., 4 m., 2 w.; s., Lord of Vendall (699, R.G.A.S.); d., Lucy des Forgettes (1372, R.G.A.S.).

III. (£2.)—Hon. Mrs. A. B. Hamilton, Sheldons, Hook, Winchfield, fawn and white, **Day's Eye 5th,** 1 y., 2 m., 6 d.; s., Philistine 2nd (571, E.G.H.B.); d., Day's Eye 4th (1821, E.G.H.B.); s. of d., Sampson (269, E.G.H.B.).

R. & V. H. C.—W. A. Glynn, Seagrove, Sea View, Isle of Wight, orange, fawn and white, **Madeleine 4th** (3456, E.G.H.B.), 9 m., 3 w., 3 d.; s., Frolic 5th (612, E.G.H.B.); d., Madeleine 2nd (1662, E.G.H.B.).

V. H. C.—W. H. Fowler, Claremont, Taunton, fawn and white, **Claremont Julia,** 1 y., 1 m., 1 w., 6 d.; s., Claremont Christopher (763, E.G.H.B.); d., Claremont Joan (2704, E.G.H.B.).

H. C.—J. C. Forster, Clatford Mills, Andover, red and white, **Clatford Spot 5th,** 1 y., 4 d.; s., Young Sarnia (848, E.G.H.B.); d., Clatford Spot 3rd (2632, E.G.H.B.):—Major C. Fraser, Byron Hall, Worthing, fawn and little white, **Felicia 2nd,** 1 y., 1 m., 1 w., 1 d.; s., Young Traveller (956, P.S., R.G.A.S.); d., Felicia (2973):—and E. A. Hambro, Hayes Place, Hayes, Kent, fawn and white, **Hayes Splendid,** 11 m., 1 w., 4 d.; s., Starlight; d., Splendid; s. of d., Vladimir.

ABERDEEN-ANGUS.

Class 65.—*Aberdeen-Angus Bull, calved in* 1894, 1895, *or* 1896. [5 entries.]

I. (£7.)—R. W. Hudson, Danesfield, Great Marlow, **Eric Macdonald** (12,475), 2 y., 2 m., 2 w., bred by J. Dixon, Leadhill, Stockfield-on-Tyne; s., Angus Macdonald (9763); d., Estelle of Leadhill (17,720); s. of d., Elocutionist (7493).

II. (£5.)—C. W. Schroeter, Tedfold, Billingshurst, Sussex, **Quince** (13,886), 2 y., 4 m., 1 w., 5 d., bred by W. Blunt, Crabbet Park, Three Bridges, Sussex; s., London (10,163); d., Queen of Stonehurst (39,906); s. of d., Financier of Ballindalloch (8328).

III. (£2.)—Col. W. N. Tufnell, Langleys, Great Waltham, Chelmsford, black, **Vescove** (13,054), 2 y., 4 m., 1 w., 2 d.; s., Goldseeker (10,030); d., Valetta (19,923); s. of d., Tinto.

R. & C.—Col. W. N. Tufnell, black, **Doodle,** 2 y., 4 m., 4 w., bred by C. P. Sykes, West Ella, Yorkshire; s., Goldseeker of Ballindalloch (10,880); d., Dudah (21,166); s. of d., Equal (8294).

Class 66.—*Aberdeen-Angus Cow, in-Milk or in-Calf, calved before* 1894. [1 entry.]

I. (£7.)—C. W. Schroeter, Tedfold, Billingshurst, Sussex, black, **Ruby 44th** (16,101), 8 y., 2 w., 1 d., bred by the Executors of the late J. Scott, Tullochs, Earler Tulloch, Laurencekirk, N.B.; s., Montrose of Melville (4085); d., Ruby 22nd (10,466); s. of d., Banks of Don (1849).

Class 67.—*Aberdeen-Angus Heifer, calved in* 1894, 1895, *or* 1896. [1 entry.]

I. (£7.)—R. W. Hudson, Danesfield, Great Marlow, **Moss Rose of Advie** (24,236), 2 y., 2 m., bred by J. Grant, Advie Mains, Strathspey; s., ustler (8761); d., Rose of the Vale (12,459); s. of d., Jeweller of Burnide (2162).

KERRY.

CLASS 68.—*Kerry Bull, calved in* 1894, 1895, *or* 1896. [4 entries.]

I. (£7) and Special (£5 5*s.*)*—ROBERTSON AND SONS, Church Farm, Babraham, Cambridge, black, **Blacksmith** (318), 2 y., 1 m., bred by C. R. W. Adeane, Babraham Hall, Cambs; s., Babraham Beau (240); d., Black Martin (1993); s. of d., Blackamoor (246).

II. (£5.)—W. H. MULLENS and R. W. STENT, Friars Hill, Guestling, black, **Canary**, 1 y., 11 m., 3 w., 3 d., bred by Lord de Vesci; s., Kingborn (296, H.B.); d., Norah (699, H.B.); s. of d., Feale (8, H.B.).

R. & H. C.—W. H. MULLENS and R. W. STENT, black, **Guestling Ganymede**, 1 y., 3 m., 1 w., 5 d.; s., Gay Lad (288, H.B.); d., Matchmaker (1927, H.B.).

C.—Capt. H. A. CARTWRIGHT, Upwood, Handley, Salisbury, black, **Coventry**, 10 m., 3 w., 3 d.; s., Peeping Tom (307, vol. iv. part 1, H.B.); d., Picotee (1688, vol. iii. part 2, H.B.).

CLASS 69.—*Kerry Cow, in-Milk or in-Calf, calved before* 1894. [4 entries.]

I. (£7.)—ROBERTSON AND SONS, The Church Farm, Babraham, Cambridge, black, **Sweet Pansy**, about 7 y., bred by J. E. Butler, Waterville, co. Kerry; d. (1438, H.B.).

II. (£5.)—W. H. MULLENS and R. W. STENT, Friars Hill, Guestling, lack, **Empress** (1940, H.B.), 4 y., 1 m., bred by R. T. Robertson, Church arm, Babraham, near Cambridge.

III. (£2.)—W. H. MULLENS and R. W. STENT, black, **Loving Cup** H.B., 2229), 4 y., 7 m.

R. & H. C.—W. H. MULLENS and R. W. STENT, black, **Dahlia**, bred by ord de la Warr, Manor House, Bexhill.

CLASS 70.—*Kerry Heifer, calved in* 1894, 1895, *or* 1896. [4 entries.]

I. (£7) and R. for Special.*—ROBERTSON AND SONS, Church Farm, Babraam, Cambridge, black, **Butterfly** (2000), 2 y., 1 m., bred by C. R. W. Adeane, abraham Hall, Cambs.; s., Babraham Beau (240); d., Butter (1514); s. of ., Kidmon Prince (148).

II. (£5.)—ROBERTSON AND SONS, black, **Love**, 2 y. about.

R. & H. C.—T. C. T. WARNER, Highams, Woodford Green, black, **Higham Beauty** (2288), calved 1895.

C.—W. H. MULLENS and R. W. STENT, Friars Hill, Guestling, black, **Dandelion**, 2 y. about, bred by Lord de la Warr, Manor House, Bexhill.

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* Given by the Kerry and Dexter Cattle Society, for the Best Animal in lass 68, 69, or 70, whose Sire and Dam were entered in the Herd Book.

DEXTER KERRY.

CLASS 71.—*Dexter Kerry Bull, calved in* 1894, 1895, *or*
[7 entries.]

I. (£7) and Special (£5 5s.)*—F. H. BAXENDALE, J.P., Fram
Framfield, Uckfield, Sussex, black, **Framfield Paragon,** 2 y.,
s., Kidmore Paradox 2nd (59); d., Dot 2nd (449); s. of d., Parad

II. (£5) and R. for Special.*—F. H. BAXENDALE, J.P., bla
field Black Diamond, 1 y., 11 m., 2 w., 1 d.; s., Kidmore I
(59); d., Kidmore Gem (277); s. of d., Paradox (18).

III. (£2.)—W. J. FLETCHER, The Chantry, Wimborne, black
Dick, 2 y., 2 w., 4 d., bred by R. Barter, St. Ann's Hill, Cork
Butt (151, K.D.H.B.); d., Aicme Cahir (670, K.D.H.B.); s.
Block (146).

R. & V. H. C.—E. S. WOODIWISS, Hill Place, Upminster,
The Doctor, about 2 y., bred by J. Robertson, La Mancha
Dublin.

H. C.—ROBERTSON AND SONS, Church Farm, Babraham,
black, **Tom Thumb,** 2 y., 2 m., 1 w., 4 d., bred by J. Coffey, K
The Masher (182); d., Kirsty (3270).

C.—W. STALLARD, Malvern Link, black, **Grandaddy,** abou
T. C. T. WARNER, Highams, Woodford Green, black, **Black Pr**
2 y., 3 m., 3 w., 5 d.; s., Denham Lord Lisburn (93); d., Ro
(309).

CLASS 72.—*Dexter Kerry Cow, in-Milk or in-Calf, calved b*
[6 entries.]

I. (£7.)—E. S. WOODIWISS, Hill Place, Upminster, Essex
Fancy, about 5 y.

II. (£5.)—E. S. WOODIWISS, red, **Fairy Queen,** about 5 y.

III. (£2.)—W. STALLARD, Malvern Link, black, **Bessie,** ab

R. & H. C.—F. H. BAXENDALE, J.P., Framfield Place, Fram
field, Sussex, black, **Framfield Emerald,** about 4 y.

CLASS 73.—*Dexter Kerry Heifer, calved in* 1894, 1895,
[14 entries.]

I. (£7.)—H.R.H. THE PRINCE OF WALES, K.G., Sandring
Dainty Girl (660), calved 1894.

II. (£5.)—ROBERTSON AND SONS, Church Farm, Babraham,
black, **Gay Parisienne,** under 3 y.

III. (£2.)—W. J. FLETCHER, The Chantry, Wimborne,
white, **Chantry Queen** (832), 2 y., 2 m., 3 w., 6 d.; s., Pro
Chantry Girl (564).

R. & V. H. C.—W. STALLARD, Malvern Link, red, **Ruby,** al

H. C.—H. HARRIS, Bowden House, Chippenham, black, **Bow**
2 y., 1 m.; s., Nero 2nd; d., Butterfly:—and ROBERTSON AND
Widow's Daughter, about 2 y.

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* Given by the Kerry and Dexter Cattle Society, for the Be
Class 71, 72, or 73, whose Sire and Dam were entered in the Herd I

C.—F. H. BAXENDALE, J.P., Framfield Place, Framfield, Uckfield, Sussex, ack, **Framfield Onyx,** 1 y., 4 m., 2 w., 3 d.; s., Framfield Don (195); , Framfield Ruby:—and H. HARRIS, black, **Bowden Beauty,** 2 y., 1 m.; , Nero 2nd; d., Perfect Gem (1505).

BUTTER TEST PRIZES.

(Given by the English Jersey Cattle Society. Open to Cows of any Breed or Cross.)

[27 entries.]

'LASS 74.—*Cows under* 900 *lbs. live weight, yielding the largest quantity of Butter by the practical Test of the Separator and Churn, judged by the scale of points adopted by the English Jersey Cattle Society.*

old, Silver and Bronze Medals were offered for the three Jersey Cows, entered or eligible for entry in the English Jersey Herd Book, competing in the test giving the greatest yields of Butter in the test.

I. **(£10)** and Silver Medal.—H. WATNEY, M.D., Buckhold, Pangbourne, lerks, fawn Jersey, **Fancy,** 11 y., 4 m., 6 d., bred by P. Syvret, St. Mary's, ersey.

II. **(£3)** and Bronze Medal.—Misses MOGG AND CORNER, Little Testwood, 'otton, Hants, fawn Jersey, **Thistle,** 3 y., 5 m., 6 d.; s., Youngsire; d., hamrock; s. of d., Dawn.

III. **(£2.)**—W. Mc. K. BRADLEY, Leylands, Meopham, Kent, whole, **leresford Gift,** 4 y., 4 w., bred by A. P. Lempriere, St. Saviour's, Jersey; , Fortescue 5th (4104); d., Carita (1390, P.S.C.); s. of d., Aster Boy 2192).

Certificate of Merit.—H. WATNEY, M.D., fawn Jersey, **Madeira,** 3 y., m., 2 w., 5 d.; s., Egyptian (4535); d., Lady of the Isles 3rd (vol. vi., . 322); s. of d., Grey of the West (1098).

'LASS 75.—*Cows* 900 *lbs. live weight and over, yielding the largest quantity of Butter by the practical Test of the Separator and Churn, judged by the scale of points adopted by the English Jersey Cattle Society.*

I. **(£10)** and Gold Medal.—H. WATNEY, M.D., Buckhold, Pangbourne, erks, fawn Jersey, **Lady of the Sunny Isles,** 5 y., 4 m., 4 d.; s., Just 3419); d., Lady of the Isles 3rd (vol. vi. p. 322); s. of d., Grey of the West 1098).

II. **(£3.)**—W. H. FOWLER, Claremont, Taunton, dark red Guernsey, **laremont Meadow Sweet** (2806, E.G.H.B.), 4 y., 9 m., 4 d., bred by - Coggan, Forest, Guernsey; s., Cogent (982, P.S., R.G.H.B.); d., Sonia 756, P.S., R.G.H.B.).

III. **(£2.)**—J. C. FORSTER, Clatford Mills, Andover, fawn and white uernsey, **Annette,** 11 y., 7 m., 1 w., 5 d., bred by Col. Shakerley, Fairlight, lastings; s., Andros (134, R.G.H.B., F.S.); d., Valerie (950, E.G.H.B.).

Certificates of Merit.—LORD ROTHSCHILD, Tring Park, Tring, Herts, wn and white Jersey, **Clemence 2nd,** 9 y., 2 m., 4 w., 1 d., bred by . Renault, St. Mary's, Jersey; s., Golden King (3323); d., Clemence I.J.H.B., 7353 F.S.):—H. WATNEY, M.D., fawn Jersey, **Sable,** 4 y., 7 m., w., 1 d.; s., Flower (4099); d., Sabina (vol. vi. p. 535); s. of d., **Mnevis** 1828).

(Given by the English Guernsey Cattle Society.)

Cow or Heifer in the Guernsey Classes, entered in the English Guernsey Cattle Society's Herd Book, yielding the largest quantity of Butter by the practical Test of the Separator and Churn. **[5 entries.]**

I. (Silver Cup.)—J. C. Forster, Clatford Mills, Andover, fawn and white, **Annette**, 11 y., 7 m., 1 w., 5 d., bred by Col. Shakerley, Fairlight, Hastings; s., Andros (134, R.G.H.B., P.S.); d., Valerie (950, E.G.H.B.).

II. (Silver Medal and £1.)—E. A. Hambro, Hayes Place, Kent, red and white, **Musette 3rd**, 6 y., 10 m., 1 w., 3 d., bred by Miss B. Martel, Preel Castel, Guernsey; s., Surprise; d., Musette 2nd; s. of d., Zanzibar.

III. (Bronze Medal and £1.)—W. H. Fowler, Claremont, Taunton, red and white, **Claremont Sweet Majorie**, 6 y., 1 m., 1 w., 3 d., bred by Le Pordevin, Vale, Guernsey.

SHEEP.

LEICESTER.

Class 76.—*Leicester Shearling Ram.* [4 entries.]

I. (£10.)—G. Harrison, Gainford Hall, Darlington, 1 y., 2 m.

II. (£5.)—G. Harrison, 1 y., 2 m.

Class 77.—*Pair of Leicester Ram Lambs, dropped in* 1897. [4 entries.]

I. (£10.)—G. Harrison, Gainford Hall, Darlington, 2 m.

II. (£5.)—Mrs. Perry-Herrick, Beau Manor Park, Loughborough, 2 m., 1 w.

R.—Mrs. Perry-Herrick, 2 m., 1 w.

Class 78.—*Pen of Three Leicester Shearling Ewes.* [4 entries.]

I. (£10.)—G. Harrison, Gainford Hall, Darlington, 1 y., 2 m.

II. (£5.)—G. Harrison, 1 y., 2 m.

R.—Mrs. Perry-Herrick, Beau Manor Park, Loughborough, 1 y., 2 m., 1 w.

COTSWOLD.

Class 79.—*Cotswold Shearling Ram.* [8 entries.]

I. (£10.)—T. R. Hulbert, North Cerney, Cirencester, 1 y., 3 m., 3 w.

II. (£5.)—R. Swanwick, Royal Agricultural College Farm, Cirencester, 1 y., 2 m., 3 w., 5 d.

III. (£2.)—R. Swanwick, 1 y., 3 m., 1 w., 3 d.

R. & H. C.—H. McCalmont, M.P., Bishopswood, Ross, **Sir Garnet**, 1 y., 2 m., bred by R. Garne, Aldsworth, Northleach.

C.—F. Craddock, Eastington, Northleach, Gloucester, 1 y., 3 m., 1 w.:—d his 1 y., 3 m., 1 w.:—T. R. Hulbert, 1 y., 3 m., 3 w.:—and Swanwick, 1 y., 4 m., 3 w.

Class 80.—*Pair of Cotswold Ram Lambs, dropped in* 1897. [3 entries.]

I. (£10.)—T. R. Hulbert, North Cerney, Cirencester, 4 m., 1 w., 2 d.

II. (£5.)—F. Craddock, Eastington, Northleach, Gloucester, 3 m., 2 w.

R. & H. C.—F. Craddock, 3 m., 2 w.

Class 81.—*Pen of Three Cotswold Shearling Ewes.* [3 entries.]

I. (£10.)—H. McCalmont, M.P., Bishopswood, Ross, 1 y., 2 m., bred by Swanwick, Royal Agricultural College, Cirencester.

II. (£5.)—T. R. Hulbert, North Cerney, Cirencester, 1 y., 3 m., 3 w.

R. & C.—F. Craddock, Eastington, Northleach, Gloucester, 1 y., 3 m. w.

KENTISH OR ROMNEY MARSH.

lass 82.—*Kentish or Romney Marsh Shearling Ram.* [10 entries.]

I. (£10.)—G. W. Finn, Westwood Court, Faversham, about 1 y., 2 m., w.

II. (£5.)—G. W. Finn, about 1 y., 2 m., 2 w.

III. (£2.)—W. Millen, Syndale Valley, Faversham, Kent, 1 y., 3 w.

R.—H. Rigden, Lyminge, Hythe, 1 y., 2 m., 2 w.

lass 83.—*Pair of Kentish or Romney Marsh Ram Lambs, dropped in* 1897. [8 entries.]

I. (£10.)—G. W. Finn, Westwood Court, Faversham, about 10 w.

II. (£5.)—W. Millen, Syndale Valley, Faversham, Kent, 2 m.

III. (£2.)—H. Rigden, Lyminge, Hythe, 10 w.

R.—H. Rigden, 10 w.

Class 84.—*Pen of Three Kentish or Romney Marsh Shearling Ewes.* [10 entries.]

I. (£10.)—G. W. Finn, Westwood Court, Faversham, about 1 y., 2 m., w.

II. (£5.)—F. Neame, Macknade, Faversham, 1 y., 2 m., 1 w.

III. (£2.)—H. Rigden, Lyminge, Hythe, 1 y., 2 m., 2 w.

R. & H. C.—F. Neame, 1 y., 2 m., 1 w.

DEVON LONG-WOOL.

Class 85.—*Devon Long-Wool Shearling Ram.* [11 entries.]

I. (£10.)—N. Cook, The Barton, Chevithorne, Tiverton, Devon, 1 y., 3 m., w.

II. (£5.)—N. Cook, 1 y., 3 m., 3 w.

III. (£2.)—A. C. SKINNER, Pound Farm, Bishop's Lydeard, So
1 y., 3 m., 3 w.

R.—C. G. THORNE, Curdon, Williton, Somerset, 1 y., 3 m.

C.—C. G. THORNE, 1 y., 2 m., 2 w.:—and F. WHITE, Torwest
Somerset, 1 y., 2 m., 3 w., bred by J. White, Torweston, Willit

CLASS 86.—*Pair of Devon Long-Wool Ram Lambs, droppe*
[4 entries.]

I. (£10.)—N. COOK, The Barton, Chevithorne, Tiverton, D
3 w.

II. (£5.)—N. COOK, 3 m., 3 w.

III. (£2.)—A. C. SKINNER, Pound Farm, Bishop's Lydear
about 3 m., 3 w.

R.—A. C. SKINNER, about 3 m., 3w.

CLASS 87.—*Pen of Three Devon Long-Wool Shearling*
[5 entries.]

I. (£10.)—N. COOK, The Barton, Chevithorne, Tiverton, Devo
3 w.

II. (£5.)—N. COOK, 1 y., 3 m., 3 w.

III. (£2.)—C. G. THORNE, Curdon, Williton, Somerset, 1 y.,

R.—J. P. MATTHEWS, Blerrick, Antony, Devonport, 1 y., 2 m

SOUTHDOWN.

CLASS 88.—*Southdown Shearling Ram.* [13 entri

I. (£10.)—EARL BATHURST, Cirencester Park, Gloucestershir
1 w.

II. (£5.)—EARL CADOGAN, Culford Hall, Bury St. Edmund
4 w.

III. (£2.)—E. ELLIS, Summersbury Hall, Shalford, Guil
3 m., 1 w.

R. & H. C.—H.R.H. THE PRINCE OF WALES, K.G., Sandri
folk, 1 y., 3 m.

H. C.—Sir J. BLYTH, Bart., Blythwood, Stansted, Essex, abou

C.—E. ELLIS, 1 y., 3 m., 1 w.:—and PAGHAM HARBOUR COM
Chichester, 1 y., 3 m., 1 w.

CLASS 89.—*Pair of Southdown Ram Lambs, dropped i*
[10 entries.]

I. (£10.)—C. R. W. ADEANE, Babraham Hall, Cambridge, abo

II. (£5.)—E. ELLIS, Summersbury Hall, Shalford, Guilford,
1 w.

III. (£2.)—PAGHAM HARBOUR COMPANY, Selsey, Chichester,

R. & H. C.—H.R.H. THE PRINCE OF WALES, K.G., Sandringh
3 m., 2 w.

H. C.—EARL CADOGAN, K.G., Culford Hall, Bury St. Edmun

E. **Ellis**, about 3 m., 1 w.:—and **Duke of Northumberland**, K.G., Park, Guildford, Surrey, 3 m., 2 w.

90.—*Pen of Three Southdown Shearling Ewes.* [5 entries.]

10.)—**Earl Bathurst**, Cirencester Park, Gloucestershire, 1 y., 3 m.,

£5.)—Sir J. **Blyth**, Bart., Blythwood, Stansted, Essex, about 1 y.,

(£2.)—H.R.H. **the Prince of Wales**, K.G., Sandringham, Nor- y., 3 m.

H. C.—**Earl Cadogan**, Culford Hall, Bury St. Edmunds.

.—E. **Ellis**, Summersbury Hall, Shalford, Guildford, 1 y., 3 m., 1 w.

HAMPSHIRE DOWN.

ASS 91.—*Hampshire Down Shearling Ram.* [13 entries.]

10) and Extra (£10.)*—A. **de Mornay**, Col. d'Arbres, Walling- ›l. **d'Arbres No. 3**, 1 y., 4 m., 5 w.

£5.)—C. **Coles**, Manor House, Winterbourne Stoke, Salisbury, n.

(£2.)—J. **Flower**, Chilmark, Salisbury, Wilts, 1 y., 4 m., 1 w.

H. C.—J. **Flower**, 1 y., 4 m., 1 w.

.—**Lord Rothschild**, Tring Park, Tring, Herts, about 1 y., 4 m., 2 w.

V. T. **Twidell**, May's Farm, Crowmarsh, Wallingford, 1 y., 4 m., and Prof. **Wrightson**, College of Agriculture, Downton, about n.

92.—*Pair of Hampshire Down Ram Lambs, dropped in* 1897. [14 entries.]

10.)—W. T. **Twidell**, May's Farm, Crowmarsh, Wallingford, m.

5.)—Prof. **Wrightson**, College of Agriculture, Downton, Salisbury, w.

£2.)—J. **Flower**, Chilmark, Salisbury, 4 m., 2 w.

V. H. C.—E. **Whalley-Tooker**, Hinton, Horndean, Hants, 4 m.

—L. H. **Baxendale**, Greenham Lodge, Newbury, Berks, 4 m., and **Lord Rothschild**, Tring Park, Tring, Herts, about 4 m., 2 w.

ord Rothschild, about 4 m., 2 w.:—and Prof. **Wrightson**, w.

LASS 93.—*Pen of Three Hampshire Down Shearling Ewes.* [3 entries.]

.0) and **R.** for Extra.*—J. **Flower**, Chilmark, Salisbury, 1 y., w.

›n by the Southampton Local Committee for Best Animal exhibited in 92, or 93.

II. (£5.)—J. Flower, 1 y., 4 m., 2 w.

R. & H. C.—J. Bonham-Carter, Adhurst St. Mary, Petersfield, 1 y., 4 m., 2 w., bred by Executors of the late M. Arnold, Westmeon, Hants.

SHROPSHIRE.

(The Third Prizes in the Shropshire Classes were given by the Shropshire Sheep Breeders' Association.)

Class 94.—*Shropshire Shearling Ram.* [27 entries.]

I. (£10.)—T. Fenn, Stonebrook House, Ludlow, 1 y., 2 m., 2 w.

II. (£5.)—A. E. Mansell, Harrington Hall, Shifnal, 1 y., 3 m.

III. (£3.)—Mrs. M. Barbs, Odstone Hall, Atherstone, 1 y., 2 m., 3 w.

IV. (£2.)—J. Bowen-Jones, Ensdon House, near Shrewsbury, about 1 y., 3 m.

R. & H. C.—A. E. Mansell, 1 y., 3 m.

H. C.—Mrs. M. Barbs, 1 y., 2 m., 3 w. :—J. Bowen-Jones, about 1 y., 3 m.:—T. Fenn, 1 y., 2 m., 2 w.:—G. L. Foster-Harter, Puckrup Hall, Tewkesbury, about 1 y., 3 m., 3 w.:—A. E. Mansell, 1 y., 3 m.:—and P. L. Mills, Ruddington Hall, Nottingham, 1 y., 3 m.

C.—A. S. Berry, Pheasey Farm, Great Barr, Birmingham, about 1 y., 3 m.:—J. Bowen-Jones, about 1 y., 3 m.:—R. P. Cooper, Berkhamsted, Herts, and Shenstone, Staffordshire:—J. Harding, Norton House, Shifnal, 1 y., 3 m., 3 w.:—and W. F. Inge, Thorpe Hall, Tamworth, about 1 y., 3 m.

Class 95.—*Pair of Shropshire Ram Lambs, dropped in* 1897. [12 entries.]

I. (£10.)—J. Harding, Norton House, Shifnal.

II. (£5.)—A. Tanner, Shrawardine, Shrewsbury, 2 m., 3 w.

III. (£3.)—P. L. Mills, Ruddington Hall, Nottingham, about 3 m.

IV. (£2.)—J. Harding.

R. & H. C.—A. Tanner, 2 m., 3 w.

C.—R. P. Cooper, Berkhamsted, Herts, and Shenstone, Staffordshire:—R. P. Cooper:—and A. E. Mansell, Harrington Hall, Shifnall, 3 m., 2 w.

Class 96.—*Pen of Three Shropshire Shearling Ewes.* [11 entries.]

I. (£10.)—Mrs. M. Barbs, Odstone Hall, Atherstone, 1 y., 2 m., 1 w.

II. (£5.)—J. Bowen-Jones, Ensdon House, near Shrewsbury, about 1 y., 3 m.

III. (£3.)—P. L. Mills, Ruddington Hall, Nottingham, 1 y., 3 m.

IV. (£2.)—T. Fenn, Stonebrook House, Ludlow, 1 y., 2 m., 2 w.

R. & H. C.—G. L. Foster-Harter, Puckrup Hall, Tewkesbury, 1 y., 3 m., 3 w.

H. C.—R. P. Cooper, Berkhamsted, Herts, and Shenstone, Staffordshire:—and W. F. Inge, Thorpe Hall, Tamworth, about 1 y., 3 m.

C.—R. P. Cooper:—Howard P. Ryland, Moxhull Park, Erdington, Birmingham, about 1 y., 3 m.:—and A. Tanner, Shrawardine, Shrewsbury, 1 y., 2 m., 3 w.

OXFORD DOWN.

Class 97.—*Oxford Down Shearling Ram.* [3 entries.]

I. (£10.)—A. Brassey, M.P., Heythrop Park, Chipping Norton, 1 y., m., 3 w.

II. (£5.)—J. T. Green, Hunton Bridge Farm, King's Langley, 1 y., m., 2 w.

R. & H. C.—J. C. Eady, Irchester Grange, Irchester, **Irchester Hopeful,** 1 y., 3 m., 2 w.

Class 98.—*Pair of Oxford Down Ram Lambs, dropped in* 1897. [2 entries.]

I. (£10.)—A. Brassey, M.P., Heythrop Park, Chipping Norton, 4 m., 2 w.

R. & H. C.—J. T. Green, Hunton Bridge Farm, King's Langley, 4 m., 3 w.

Class 99.—*Pen of Three Oxford Down Shearling Ewes.* [2 entries.]

I. (£10.)—A. Brassey, M.P., Heythrop Park, Chipping Norton, 1 y., 4 m.

R. & H. C.—J. C. Eady, Irchester Grange, 1 y., 3 m., 2 w.

SOMERSET AND DORSET HORN.

Class 100.—*Somerset and Dorset Horn Shearling Ram.* [6 entries.]

I. (£10.)—E. Kidner, Cothelstone, Taunton, Somerset, **Cothelstone Duke 1st,** 1 y., 5 m., 1 w.

II. (£5.)—E. Kidner, **Duke 2nd,** 1 y., 5 m., 2 w.

III. (£2.)—W. R. Flower, West Stafford, Dorchester, **Flower's No. 51,** y., 5 m., 1 w.

R.—W. R. Flower, **Flower's No. 52,** about 1 y., 5 m., 1 w.

Class 101.—*Pair of Somerset and Dorset Horn Ram Lambs, dropped after Nov. 1st,* 1896. [4 entries.]

I. (£10.)—W. R. Flower, West Stafford, Dorchester, about 5 m., 3 w.

II. (£5.)—W. R. Flower, about 5 m., 3 w.

R.—H. McCalmont, M.P., Bishopswood, Ross, 5 m., 4½ w.

Class 102.—*Pen of Three Somerset and Dorset Horn Shearling Ewes.*— [6 entries.]

I. (£10.)—H. McCalmont, M.P., Bishopswood, Ross, 1 y., 6 m., bred by . Kidner, Nynehead, Wellington, Somerset.

II. (£5.)—H. McCalmont, M.P., 1 y., 6 m., bred by J. Kidner.

III. (£2.)—W. R. Flower, West Stafford, Dorchester, about 1 y., 5 m., 1 w.

R. & H. C.—W. R. Flower, about 1 y., 5 m., 1 w.

C.—L. C. Attrill, Bowcombe Farm, Carisbrook, Isle of Wight, y., 5 m.

PIGS.

BERKSHIRE.

Class 103.—*Berkshire Boar, farrowed in* 1894 *or* 1895. [4 entries.]

I. (£7.)—E. Burbidge, South Wraxall, Bradford-on-Avon, **Wraxhall Halle**, 2 y., 1 m.; s., Halle; d., Highclere B. 6th; s. of d., Ransome.

II. (£3.)—A. Hiscock, jun., Manor Farm, Motcombe, Dorset, **Manor Star**, 2 y., 10 m., 2 w., 3 d., bred by — Ray, Gillingham; s., Jonathan; d., Thorngrove Duchess; s. of d., Marmaduke (4059).

R. & H. C.—Earl of Carnarvon, Highclere Castle, Newbury, **Highclere Sambo** (5816), 1 y., 9 m., 2 w., 6 d., bred by R. Swanwick, Royal Agricultural College Farm, Cirencester; s., Barton Stumpy (5560); d., Sallie 786th (5228); s. of d., Choice Curzon (3669).

Class 104.—*Berkshire Boar, farrowed in* 1896. [7 entries.]

I. (£7.)—Earl of Carnarvon, Highclere Castle, Newbury, **Highclere Rover** (5821), 1 y., 1 w., 4 d.; s., Marnhull Duke (5120); d., Highclere Rose (5550); s. of d., Manor Hero (5140).

II. (£3.)—E. Burbidge, South Wraxall, Bradford-on-Avon, 1 y., 3 w.; s., Swansea; d., Stillroom Maid; s. of d., Halle.

III. (£2.)—R. Swanwick, Royal Agricultural College Farm, Cirencester, 1 y., 2 m., 3 w., 1 d.; s., Andover C. (5562, B.B.); d., Stumpy 827 (3313, B.B.); s. of d., Prince Imperial (2171, B.B.).

R. & H. C.—J. Lawrence, Stall Pitts, Shrivenham, Berks, **Limestone**, 1 y., 2 w., 4 d.; s., Gilbert (4819); d., Josephine (1015); s. of d., Garnstone 2nd (789).

C.—A. Brown, Hill Farm Dairy, Southampton, 9 m., bred by A. Caird, late of Northbrook Farm, Micheldever, Hants; s., Dr. Jameson; d., Halle's Starlight; s. of d., Halle Starlight Eve.

Class 105.—*Pair of Berkshire Boars, farrowed in* 1897. [4 entries.]

I. (£5.)—A. Hiscock, jun., Manor Farm, Motcombe, Dorset, 4 m., 3 w., 1 d.; s., Manor Star (vol. xiv. B.B.H.B.); d., La Fleche (3747); s. of d., Bella Lad (2370).

II. (£2.)—J. Saunders, Sutton, Cranborne, Dorset, 4 m., 3 w.; s., Saxon King 2nd (5729); d., Cranborne Lass (5117); s. of d., Hibernian (3637).

R. & H. C.—J. Lawrence, Stall Pitts, Shrivenham, 3 m., 2 w., 2 d.; s. Lohmann; d., Marie Augustus 6th (5200); s. of d., Challenge Augustu (3598).

Class 106.—*Berkshire Breeding Sow, farrowed before* 1897. [10 entries.]

I. (£7).—G. T. Tomkin, The Moat, Marden, Kent, 1 y., 3 m., 3 w., 2 d.

II. (£3.)—A. Hiscock, jun., Manor Farm, Motcombe, Dorset, **Man Telezit**, 1 y., 5 m., 2 d., bred by J. Fricker, Mere, Wilts; s., Highm (4750); d., Ezil 2nd (5080).

II. (£2.)—EARL OF CARNARVON, Highclere Castle, Newbury, **Highclere**
d (5418), 2 y., 2 m., 2 w., 5 d., bred by E. Hayter, The Mount,
itchurch, Hants; s., Barney (5051); d., Highclere 14th (5043); s. of d.,
le (3626).

L & H. C.—J. LAWRENCE, Stall Pitts, Shrivenham, Berks, **Lucerne,**
, 2 w., 4 d.; s., Gilbert (4819); d., Josephine (1015); s. of d., Garnstone
(789).

I. C.—E. BURBIDGE, South Wraxall, Bradford-on-Avon, 1 y., 3 m.,
., 2 d.; s., Swansea; d., Sarah Jane:—and EARL OF CARNARVON, **High-**
re Beauty, 1 y., 4 m., 2 d., bred by Sir H. F. de Trafford, Bart., Swafield
ise, North Walsham; s., Lord Windsor (4932); d., Short Green Beauty
49); s. of d., Prime Minister (3295).

.—A. BROWN, Hill Farm Dairy, Southampton, 9 m., bred by A. Caird,
Northbrook Farm, Micheldever; s., Dr. Jameson; d., Halle's Starlight;
f d., Halle Starlight Eve.

LASS 107.—*Pair of Berkshire Breeding Sows, farrowed in* 1897. [5 entries.]

. (£5.)—A. HISCOCK, jun., Manor Farm, Motcombe, Dorset, 4 m., 3 w.,
.; s., Manor Star (vol. xiv. B.B.H.B.); d., La Fleche (3747); s. of d.,
la Lad (2370).

I. (£2.)—J. SAUNDERS, Sutton, Cranborne, Dorset, 4 m., 3 w.; s., Saxon
ig 2nd (5729); d., Cranborne Lass (5117); s. of d., Hibernian (3637).

L & H. C.—J. LAWRENCE, Stall Pitts, Shrivenham, Berks, 3 m., 2 w.,
l.; s., Lohmann; d., Marie Augustus 6th (5200); s. of d., Challenge
gustus (3598).

.—EARL OF CARNARVON, Highclere Castle, Newbury, 4 m., 1 w., 3 d.;
Highclere Castle (5363); d., Highclere Rose (5550); s. of d., Manor Hero
40).

LARGE WHITE.

CLASS 108.—*Large White Boar, farrowed in* 1894 *or* 1895. [4 entries.]

. (£7.)—Sir G. GREENALL, Bart., Walton Hall, Warrington, **Walton**
psman (3623), 3 y., 4 m., 3 w., 1 d.; s., Duke of Lancaster 2nd (2653);
Sunbeam 8th (4756); s. of d., Ben 3rd (927).

II. (£3.)—Sir G. GREENALL, Bart., **Duke of York** (3471), 2 y., 9 m.,
., 5 d., bred by P. Ascroft, Rufford, Ormskirk; s., Gamester 5th (3049);
Princess May (5254); s. of d., Borrowfield Earl (929).

R.—F. ALLMAND, Victoria Flour Mills, Wrexham, **Wrexham Phil** (4111),
., 2 m., 3 w., bred by P. Ascroft, Rufford; s., Long Sam (339); d., Hope
1 (2360); s. of d., Rufford Rover (781).

CLASS 109.—*Large White Boar, farrowed in* 1896. [5 entries.]

I. (£7.)—S. SPENCER, Holywell Manor, St. Ives, Hunts, 1 y., 4 m., 3 w.,
l.; s., Holywell Dublin (2681); d., Holywell Monster; s. of d., Holywell
nger (2305).

II. (£3.)—Sir G. GREENALL, Bart., Walton Hall, Warrington, **Walton**
tesman, 1 y., 4 m., 1 w.; s., Walton Eclipse (3621); d., Walton
chess (6008); s. of d., Duke of Lancaster 2nd (2653).

III. (£2.)—F. ALLMAND, Victoria Flour Mills, Wrexham, **Wrexha Dan**, 1 y., 3 m., 3 w., bred by E. Buss, Horsmonden, Kent; s., **Borrowfiel** Prince 9th (3857); d., Elphick's White Rose (5818); s. of d., **Holywell Bat** (1799).

CLASS 110.—*Pair of Large White Boars, farrowed in* 1897.

[1 entry.]

I. (£5.)—F. ALLMAND, Victoria Flour Mills, Wrexham, 4 m., 2 w.; s Wrexham Rob 2nd (4107); d., Wrexham Nellie (5316); s. of d., **Wrexha** Joe (2843).

CLASS 111.—*Large White Breeding Sow, farrowed before* 1897.

[5 entries.]

I. (£7.)—Sir G. GREENALL, Bart., Walton Hall, Warrington, **Metchle Hope 3rd** (5912), 3 y., 4 m., 2 w., 4 d., bred by D. Gibson, The Fiel Harbury, Leamington; s., Borrowfield Ruffold (1171); d., **Metchley Heroi** (5218); s. of d., Metchley King (2321).

II. (£3.)—S. SPENCER, Holywell Manor, St. Ives, Hunts, **Holywe Waxy**, 4 y., 4 m., 1 w.; s., Holywell Plymouth (1829); d., Holywell Wa work; s. of d., Holywell King (509).

III. (£2.)—F. ALLMAND, Victoria Flour Mills, Wrexham, **Wrexha Belle** (6828), 2 y., 4 m., 1 w.; s., Wrexham Ben (3633); d., Wrexha Katie (6032); s. of d., Wrexham Joe (2843).

R.—F. ALLMAND, **Wrexham Maggie** (6038), 3 y., 4 m., 1 w.; Wrexham Joe (2843); d., Wrexham Jennie (4790).

CLASS 112.—*Pair of Large White Breeding Sows, farrowed in* 1897.

[3 entries.]

I. (£5.)—Sir G. GREENALL, Bart., Walton Hall, Warrington, 4 m., 1 w 6 d.; s., Long Sam (339); d., Walton Magenta (6790); s. of d., **Metchle** King (2321).

II. (£2.)—F. ALLMAND, Victoria Flour Mills, Wrexham, 4 m., 2 w.; s Wrexham Phil (4111); d., Wrexham Mary; s. of d., **Wrexham Sa** (3213).

R.—F. ALLMAND, 4 m., 2 w.; s., Wrexham Joe (4117); d., **Wrexha** Juno (6846).

MIDDLE WHITE BREED.

CLASS 113.—*Middle White Boar, farrowed in* 1894 *or* 1895.

[2 entries.]

I. (£7.)—Sir G. GREENALL, Bart., Walton Hall, Warrington, **Walto Surprise** (4175), 1 y., 9 m., 3 w., 4 d.; s., Walton **Major** (3695); Walton Pride (5420); s. of d., Prince of Worsley (1527).

CLASS 114.—*Middle White Boar, farrowed in* 1896. [3 entries.]

I. (£7.)—S. SPENCER, Holywell Manor, St. Ives, Hunts, **Holywell Cou Victor**, 1 y., 1 m., 3 w.; s., Holywell Count (3239); d., Holywell **Madg** s. of d., Holywell Baron 2nd (2869).

II. (£3.)—Sir G. Greenall, Bart., Walton Hall, Warrington, **Walton ictator,** 1 y., 4 m.; s., Grappenhall Dictator (3231); d., Walton Rose 926); s. of d., Walton Major (3695).

R.—A. C. Twentyman, Castlecroft, Wolverhampton, **Castlecroft olden King,** 1 y., 3 m., 2 w., 6 d.; s., Marden Pure Gold (3253); d., astlecroft Rose 2nd (6876); s. of d., Young Juan (1551).

Class 115.—*Pair of Middle White Boars, farrowed in* 1897.
[3 entries.]

I. (£5.)—A. C. Twentyman, Castlecroft, Wolverhampton, 4 m., 3 w., ., Morden Pure Gold (3253); d., Castlecroft Daffodil (6874); s. of d., Castleroft Robin Hood (3651).

II. (£2.)—Hon. D. P. Bouverie, Coleshill House, Highworth, Wilts, m., 3 w., 3 d.; s., Coleshill Joey (vol. xii.); d., Coleshill Daisy; s. of d., ingdale Hero (vol. xiii.).

R.—Sir G. Greenall, Bart., Walton Hall, Warrington, 4 m., 2 w., 4 d.; ., Walton Editor (vol. xiii.); d., Walton Mayflower 2nd (6126); s. of d., adger (2845).

Class 116.—*Middle White Breeding Sow, farrowed before* 1897.
[7 entries.]

I. (£7.)*—S. Spencer, Holywell Manor, St. Ives, Hunts, **Holywell iddlesborough,** 5 y., 6 m., 4 w., 2 d.; s., Holywell Slasher (2069); d., olywell Satin 2nd; s. of d., Holywell Ponfield (1113).

II. (£3.)—Sir G. Greenall, Bart., Walton Hall, Warrington, **Walton cacia,** 1 y., 9 m., 3 w., 4 d.; s., Walton Major (3695); d., Walton Pride 420); s. of d., Prince of Worsley (1527).

III. (£2.)—A. C. Twentyman, Castlecroft, Wolverhampton, **Castlecroft rilby** (6880), 1 y., 11 m., 3 w., 3 d.; s., Castlecroft Robin Hood (3651); ., Castlecroft Daisy Bell (5328); s. of d., Bruce (2451).

R. & H. C.—A. C. Twentyman, **Castlecroft Daisy Bell** (5328), y., 4 m., 2 w., 4 d.; s., Bruce (2451); d., Castlecroft Marigold (5334); . of d., Young Juan (1551).

H. C.—Hon. D. P. Bouverie, Coleshill House, Highworth, Wilts, **Colesill Katherine** (vol. xiii.), 1 y., 4 m., 3 w.; s., Ringdale Hero (vol. xiii.); ., Hollywell Fizzie (5370); s. of d., Holywell St. Simon (2871).

C.—J. Saunders, Sutton, Cranborne, Dorset, **Ruth,** 1 y., 5 m., bred by . T. Waite, Tarrant, Gunville, Blandford.

Class 117.—*Pair of Middle White Breeding Sows, farrowed in* 1897.
[3 entries.]

I. (£5.)—A. C. Twentyman, Castlecroft, Wolverhampton, 4 m., 3 w.; s., orden Pure Gold (3253); d., Castlecroft Daffodil (6874); s. of d., Castlecroft obin Hood (3651).

II. (£2.)—Hon. D. P. Bouverie, Coleshill House, Highworth, Wilts, m., 3 w.; s., Coleshill Joey (vol. xiii.); d., Hollywell Fizzie (5370); s. of d., olywell St. Simon (2871).

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* Did not afterwards qualify.

III. (£1.)—Sir G. Greenall, Bart., Walton Hall, Warrington, 4 m., 2 w., 4 d.; s., Walton Editor (vol. xiii.); d., Walton Mayflower 2nd (6126); s. of d., Badger (2845).

SMALL WHITE OR SMALL BLACK BREED.

Class 118.—*Small White or Small Black Boar, farrowed in* 1894 *or* 1895. [2 entries.]

I. (£7.)—Hon. D. P. Bouverie, Coleshill House, Highworth, Wilts, **Coleshill Royal Emperor**, 1 y., 9 m., 3 w.; s., Coleshill Joe (2885); d., Coleshill Empress (5444); s. of d., King William (2097).

II. (£3.)—Hon. D. P. Bouverie, **Coleshill Eastbourne**, 1 y., 11 m.; s., Prescott (2897); d., Coleshill Lady (5446); s. of d., King William (2097).

Class 119.—*Small White or Small Black Boar, farrowed in* 1896. [6 entries.]

I. (£7.)—Hon. D. P. Bouverie, Coleshill House, Highworth, Wilts, **Coleshill Edward** (vol. xiii.), 1 y., 4 m., 3 w., 3 d.; s., Prescott (2897); d., Coleshill Empress (5444); s. of d., King William (2097).

II. (£3.)—Hon. D. P. Bouverie, **Coleshill Model** (vol. xiii.), 10 m., 4 d.; s., Coleshill Dick (vol. xiii.); d., Coleshill Susan (5460); s. of d., King William (2097).

III. (£2.)—Hon. D. P. Bouverie, 11 m., 1 w.; s., Coleshill Dick (vol. xiii.); s. of d., Coleshill Empress (5444).

R. & H. C.—A. Hiscock, jun., Manor Farm, Motcombe, Dorset, **Manor Tom Thumb**, 1 y., 4 m., 6 d., bred by D. Gibson, Harbury, Leamington; s., Metchley Tom Thumb (3273); d., Metchley Royal (5466); s. of d., King William (2097).

H. C.—J. P. Chissell, Cowgrove Farm, Wimborne, 1 y., 2 m., 2 w.

Class 120.—*Pair of Small White or Small Black Boars, farrowed in* 1897. [2 entries.]

I. (£5.)—Hon. D. P. Bouverie, Coleshill House, Highworth, Wilts, 4 m., 3 w., 1 d.; s., Coleshill Dick (vol. xiii.); d., Coleshill Princess (6942); s. of d., Coleshill Joe (2885).

II. (£2.)—Hon. D. P. Bouverie, 4 m., 3 w.; s., Coleshill Peter (4177); d., Coleshill Betsy (5440); s. of d., King William (2097).

Class 121.—*Small White or Small Black Breeding Sow, farrowed before* 1897. [5 entries.]

I. (£7.)—A. Hiscock, jun., Manor Farm, Motcombe, Dorset, **Manor Perfection**, 1 y., 4 m., 6 d., bred by D. Gibson, Harbury Fields, Leamington; s., Metchley Tom Thumb (3273); d., Metchley Royal (5466); s. of d., King William (2097).

II. (£3.)—Hon. D. P. Bouverie, Coleshill House, Highworth, Wilts, **Coleshill May** (vol. xiii.), 1 y., 4 m., 3 w., 2 d.; s., Prescott (2897); d., Coleshill Empress (5444); s. of d., King William (2097).

III. (£2.)—Hon. D. P. Bouverie, **Coleshill Perfection** (6940), 2 y., 2 m.; s., Prescott (2897); d., Coleshill Sunbeam 2nd (5458); s. of d., King William (2097).

R.—J. P. CHISSELL, Cowgrove Farm, Wimborne, 1 y., 6 m.

C.—Hon. D. P. BOUVERIE, **Coleshill Fancy** (vol. xiii.), 10 m., 4 d.; s., Coleshill Dick (vol. xiii.); d., Coleshill Susan (5460); s. of d., King William (2097).

CLASS 122.—*Pair of Small White or Small Black Breeding Sows, farrowed in* 1897. [2 entries.]

I. (£5.)—Hon. D. P. BOUVERIE, Coleshill House, Highworth, Wilts, 4 m., 3 w., 1 d.; s., Coleshill Dick (vol. xiii.); d., Coleshill Princess (6942); s. of d., Coleshill Joe (2885).

II. (£2.)—Hon. D. P. BOUVERIE, 4 m., 2 w., 4 d.; s., Coleshill Dick (vol. xiii.); d., Coleshill Susan 2nd (5460); s. of d., King William (2097).

TAMWORTH.

CLASS 123.—*Tamworth Boar, farrowed in* 1894 *or* 1895. [2 entries.]

I. (£7.)—R. IBBOTSON, The Hawthorns, Knowle, Warwickshire, **Euclid**, 1 y., 11 m., 1 w.; s., Knowle Monarch (3781); d., Knowle Rosy (5592); s. of d., Excelsior (2501).

CLASS 124.—*Tamworth Boar, farrowed in* 1896. [5 entries.]

I. (£7.)—Col. I. J. C. HERBERT, C.B., C.M.G., Llanarth Court, Raglan, Mon., **Llanarth Commander**, 9 m., 3 w., 5 d., bred by T. Tompson, Holt Hall, Whitacre, Birmingham; s., Holt Commander (3771); d., Lady Birmingham (5598); s. of d., Gun Hill Chieftain (2929).

II. (£3.)—R. IBBOTSON, The Hawthorns, Knowle, Warwickshire, **Knowle Red Duke**, 10 m., 3 w., 4 d.; s., Knowle Baron (4229); d., Knowle Ruby 3rd; s. of d., Knowle Major.

III. (£2.)—D. W. PHILIP, The Ashes, Whitacre, Warwickshire, **Whitacre Earl**, 8 m., 2 w., 1 d.; s., Whitacre Captain (4257); d., Whitacre Countess (4378); s. of d., Gun Hill Prince (1591).

CLASS 125.—*Pair of Tamworth Boars, farrowed in* 1897. [5 entries.]

I. (£5.)—R. IBBOTSON, The Hawthorns, Knowle, Warwickshire, 4 m., 2 w., 3 d., bred by T. Watson, Whitacre Hall, Coleshill; s., Warwickshire Monarch; d., Warwickshire Lady; s. of d., Whitacre Goldfinder.

II. (£2.)—D. W. PHILIP, The Ashes, Whitacre, Warwickshire, 4 m., 3 w., 1 d.; s., Knowle Duke 2nd (vol. xiii.); d., Whitacre Pride (3938); s. of d., Gun Hill Prince (1591).

R. & H. C.—Col. I. J. C. HERBERT, C.B., C.M.G., Llanarth Court, Raglan, Mon., 3 m., 3 w., 6 d.; s., Knowle Baron (4229); d., Castle Bromwich Pansy (6254); s. of d., Duke of Westminster (2919).

CLASS 126.—*Tamworth Breeding Sow, farrowed before* 1897. [9 entries.]

I. (£7.)—Col. I. J. C. HERBERT, C.B., C.M.G., Llanarth Court, Raglan, Mon., **Llanarth Confidence 2nd**, 1 y., 2 m., 5 d., bred by T. Clayton, Park Hall Farm, Castle Bromwich, Birmingham; s., Knowle Rector (3783); d., Llanarth Confidence (4922); s. of d., Llanarth Duke (2523).

II. (£3.)—D. W. Philip, The Ashes, Whitacre, Warwickshire, **Whitacre Countess 2nd,** 1 y., 2 m., 3 w., 1 d.; s., Whitacre Chief (3837); d., Whitacre Countess (4378); s. of d., Gun Hill Prince (1591).

III. (£2.)—Col. I. J. C. Herbert, C.B., C.M.G., **Llanarth Confidence,** 4 y., 11 m., 3 w., 1 d., bred by the late J. A. Herbert, Llanarth Court, Raglan, Mon.; s., Llanarth Duke (2523); d., Llanarth Princess (4310); s. of d., Gun Hill Prince (1591).

R. & H. C.—R. Ibbotson, The Hawthorns, Knowle, Warwickshire, **Warwickshire Lady,** 3 y., 1 w., 5 d., bred by T. Watson, Whitacre Hall, near Coleshill; s., Whitacre Goldfinder; d., Warwickshire Jewell; s. of d., Gun Hill Prince.

Class 127.—*Pair of Tamworth Breeding Sows, farrowed in* 1897. [5 entries.]

I. (£5.)—R. Ibbotson, The Hawthorns, Knowle, Warwickshire, 4 m., 3 w.; s., Knowle Monarch 2nd; d., Knowle Princess May; s. of d., Knowle Duke.

II. (£2.)—D. W. Philip, The Ashes, Whitacre, Warwickshire, 3 m., 3 w., 3 d.; s., Knowle Falconer (vol. xiii.); d., Whitacre Belle (6442); s. of d., Gun Hill Reliance (2155).

R. & H. C.—Col. I. J. C. Herbert, C.B., C.M.G., Llanarth Court, Raglan, Mon., 3 m., 3 w., 6 d.; s., Knowle Baron (4229); d., Castle Bromwich Pansy (6254); s. of d., Duke of Westminster (2919).

PRODUCE.

PRIZES FOR CIDER.

(Open to Growers or Makers.)

First Prize in each Class, a Silver Medal and a Certificate, Second Prize in each Class, a Bronze Medal and a Certificate.

Champion Prize, for Best Exhibit in any of the Classes, a Gold Medal and a Certificate.

(The Cider must have been made in 1896, and each Exhibit in Cask was not less than 18 gallons.)

Cider made in Devon.

Class 128.—*Cask of Cider* (*open to* Landowners *only*). [1 entry.]

I. (Silver Medal.)—Sir J. H. H. Amory, Bart., Knightshayes Court, Tiverton, Devon.

Class 129.—12 *Bottles of Cider* (*open to* Landowners *only*). [2 entries.]

I. (Silver Medal) and Champion (Gold Medal.)—Sir J. H. H. Amory, Bart., Knighthayes Court, Tiverton, Devon.

II. (Bronze Medal.)—R. F. Rendell, Kingston House, Staverton, Totnes

CLASS 130.—*Cask of Cider (open to* TENANT FARMERS *only).*
[1 entry.]

I. (Silver Medal.)—H. HAYDON, Chettiscombe, Tiverton, Devon.

CLASS 131.—12 *Bottles of Cider (open to* TENANT FARMERS *only).*
[1 entry.]

I. (Silver Medal.)—H. HAYDON, Chettiscombe, Tiverton, Devon.

CLASS 132.—*Cask of Cider (open to* CIDER MERCHANTS *only).*
[1 entry.]
[NO AWARD.]

CLASS 133.—12 *Bottles of Cider (open to* CIDER MERCHANTS *only).*
[1 entry.]
[NO AWARD.]

Cider made in Herefordshire.

CLASS 134.—*Cask of Cider (open to* LANDOWNERS *only).*
[NO ENTRY.]

CLASS 135.—12 *Bottles of Cider (open to* LANDOWNERS *only).*
[NO ENTRY.]

CLASS 136.—*Cask of Cider (open to* TENANT FARMERS *only).*
[1 entry.]
[NO AWARD.]

CLASS 137.—12 *Bottles of Cider (open to* TENANT FARMERS *only).*
[1 entry.]
[NO AWARD.]

CLASS 138.—*Cask of Cider (open to* CIDER MERCHANTS *only).*
[2 entries.]

II. (Bronze Medal.)—H. P. BULMER AND Co., Ryelands, Hereford.

CLASS 139.—12 *Bottles of Cider (open to* CIDER MERCHANTS *only).*
[5 entries.]

I. (Silver Medal.)—H. P. BULMER AND Co., Ryelands, Hereford.

Cider made in Somerset.

CLASS 140.—*Cask of Cider (open to* LANDOWNERS *only).*
[NO ENTRY.]

CLASS 141.—12 *Bottles of Cider (open to* LANDOWNERS *only).*
[NO ENTRY.]

CLASS 142.—*Cask of Cider* (*open to* TENANT FARMERS *only*).
[6 entries.]

I. (Silver Medal.)—J. H. SYMES, Coat Farm, Martock.

II. (Bronze Medal.)—R. W. SCOTT, East Lambrook Farm, Kingsbury, Ilminster.

CLASS 143.—12 *Bottles of Cider* (*open to* TENANT FARMERS *only*).
[6 entries.]

I. (Silver Medal.)—R. W. SCOTT, East Lambrook Farm, Kingsbury, Ilminster.

II. (Bronze Medal.)—J. H. SYMES, Coat Farm, Martock.

CLASS 144.—*Cask of Cider* (*open to* CIDER MERCHANTS *only*).
[1 entry.]
[NO AWARD.]

CLASS 145.—12 *Bottles of Cider* (*open to* CIDER MERCHANTS *only*).
[2 entries.]
[NO AWARD.]

Cider made in Counties other than Devon, Herefordshire, or Somerset.

CLASS 146.—*Cask of Cider* (*open to* LANDOWNERS *only*). [1 entry.]
[NO AWARD.]

CLASS 147.—12 *Bottles of Cider* (*open to* LANDOWNERS *only*).
[3 entries.]
[NO AWARD.]

CLASS 148.—*Cask of Cider* (*open to* TENANT FARMERS *only*).
[NO ENTRY.]

CLASS 149.—12 *Bottles of Cider* (*open to* TENANT FARMERS *only*).
[2 entries.]
[NO AWARD.]

CLASS 150.—*Cask of Cider* (*open to* CIDER MERCHANTS *only*).
[2 entries.]

I. (Silver Medal.)—R. ROUT AND SON, Banham, Attleborough, Norfolk.

CLASS 151.—12 *Bottles of Cider* (*open to* CIDER MERCHANTS *only*).
[5 entries.]

I. (Silver Medal.)—R. ROUT AND SON, Banham, Attleborough, Norfolk.

II. (Bronze Medal.)—R. ROUT AND SON.

CHEESE.

CLASS 152.—*Four Cheeses (the total weight being not less than 224 lbs.) made in* 1896. [30 entries.]

I. (£20.)—E. T. GREEN, Steeple Ashton, Trowbridge.

II. (£12.)—E. T. GREEN.

III. (£8.)—H. E. TUCKER, Church Farm, Steeple Ashton, Trowbridge.

IV. (£6.)—F. W. J. CROCKER, Redford Farm, Batcombe, Cattistock.

R.—H. G. ASHMAN, Beacon Farm, Shepton Mallet.

H. C.—C. CANDY, Temple House Farm, Doulting, Shepton Mallet:—and W. SALMON, Yondor Broadpool Farm, Doulting, Shepton Mallet.

CLASS 153.—*Four Cheeses (the total weight being not less than* 112 *lbs.) made in* 1896. [20 entries.]

I. (£12.)—E. T. GREEN, Steeple Ashton, Trowbridge.

II. (£8.)—E. T. GREEN.

III. (£6.)—T. C. CANDY, Woolcombe, Cattistock, Dorset.

IV. (£4.)—J. D. ARMSTRONG, Vallis Farm, Frome.

R. & H. C.—Mrs. L. J. BUGG, Bungay's Farm, Stalbridge.

CLASS 154.—*Four Cheddar Cheeses (the total weight being not less than* 112 *lbs.) made in* 1896 *by a Student who has received not less than a week's instruction in one of the Society's Cheese Schools.* [10 entries.]

I. (£10.)—Mrs. T. J. GIDDINGS, Manor Farm Dairy, Chilcompton, Bath.

II. (£6.)—E. A. H. BURFITT, Goodedge Farm, North Bruham, Bruton.

III. (£4.)—Mrs. J. SHEPPY, Iwood House, Congresbury.

IV. (£3.)—Miss D. E. VAUGHAN, Double Gates, Bushley, Tewkesbury.

CLASS 155.—*Four Cheeses (the total weight being not less than* 112 *lbs.) made in* 1897. [30 entries.]

I. (£10.)—H. CANNON, Milton Clevedon, Evercreech.

II. (£6.)—H. CANNON.

III. (£4.)—Mrs. J. SHEPPY, Iwood House, Congresbury.

IV. (£3.)—E. T. GREEN, Steeple Ashton, Trowbridge.

R.—H. G. ASHMAN, Beacon Farm, Shepton Mallet.

H. C.—H. G. ASHMAN:—and W. C. SPENCER, North Perrott, Crewkerne.

CLASS 156.—*Four Cheddar Cheeses (the total weight being not less than* 112 *lbs.) made in* 1897 *by a Student who has received not less than a week's instruction in one of the Society's Cheese Schools.* [14 entries.]

I. (£8.)—Miss A. SAGE, Batcombe, Evercreech.

II. (£5.)—Miss A. SAGE.

III. (£2.)—Mrs. J. SHEPPY, Iwood House, Congresbury.

IV. (£1.)—Mrs. R. A. PERRY, Upper Row Farm, Laverton, F

H. C.—Mrs. F. C. CANDY, Prestleigh Lower Farm, Shepton Mrs. J. SHEPPY.

C.—Mrs. R. A. PERRY.

CLASS 157.—*Ten Loaf or other Truckle Cheeses made* [18 entries.]

I. (£5.)—H. H. PICKFORD, Cumberwell, Bradford-on-Avon.

II. (£3.)—J. MARTIN, Lottisham, Glastonbury.

III. (£2.)—Mrs. J. SHEPPY, Iwood House, Congresbury.

IV. (£1.)—E. DEWDNEY, Chewton Mendip, Bath.

R. & H. C.—Mrs. L. J. BUGG, Bungay's Farm, Stalbridge.

C.—H. G. ASHMAN, Beacon Farm, Shepton Mallet:—and Kingston, Wareham.

CLASS 158.—*Four Caerphilly Cheeses made in* 1897. [9

I. (£3.)—Mrs. W. T. S. TILLEY, North Wootton, Shepton

II. (£2.)—W. HARRIS and SON, Court House Farm, Cam,

III. (£1.)—J. BOARD, Hill Farm, East Pennard, Shepton

H. C.—J. BOARD.

C.—H. CANNON, Milton Clevedon, Evercreech.

CLASS 159.—*Five Cream or other Soft Cheeses.* [15

I. (£3.)—E. FLANDERS, 84, Regent Street, Derby.

II. (£2.)—DEVIZES FARMERS' PRODUCE ASSOCIATION, LIMITED

III. (£1.)—G. H. COOPER, West of England Creamery,

H. C.—Mrs. F. C. LOXTON, St. James's Dairy, Bath.

C.—Mrs. F. C. LOXTON.

BUTTER AND CREAM.

(These Classes were not open to Professional Teachers.)

CLASS 160.—3 *lbs. of Fresh (or very slightly salted) rolls or brick shapes, made of Cream from Cows other Island Breeds.* [30 entries.]

I. (£5.)—J. WILLIAMS, Regilbury Park, Winford.

II. (£3.)—C. HAYES, Keyford House Farm, Frome.

III. (£2.)—Miss M. K. HARRIS, Brownsell Park, Blandford.

IV. (£1.)—BELGRAVIA DAIRY COMPANY, LIMITED, 4 and 6, Road, London, S.W.

R. & V. H. C.—Miss C. J. Day, Manor Farm, Earl's Barton, Northmpton.

V. H. C.—J. Baines, West End Farm, Henfield:—and G. H. Cooper, West of England Creamery, Highbridge.

H. C.—Mrs. J. T. Dibsdall, Burnt House Farm, Chelvey, West Town, Bristol:—and Mrs. J. Okell, Park Farm, Barrow, near Chester.

CLASS 161.—3 *lbs. of Fresh (or very slightly salted) Butter, in pound rolls or brick shapes, made of Cream from Cows of Channel Island Breeds only.* [34 entries.]

I. (£5) and Special (£1.)*—A. Gibbs, Tyntesfield, Bristol.

II. (£3.)—Mrs. McIntosh, Havering Park, Essex.

III. (£2.)—A. F. Somerville, Dinder, Wells, Somerset.

IV. (£1.)—Lord Poltimore, Poltimore Park, Exeter.

R. & V. H. C.—C. Combe, Cobham Park, Surrey.

V. H. C.—Hon. A. H. Holland-Hibbert, Munden, Watford, Herts.

H. C.—Mrs. T. Emery, Elm Tree Farm, Portbury:—Duke of Marlborough, Blenheim Palace, Woodstock:—Lady Mather-Jackson, Llantilio Court, Abergavenny:—Mrs. C. M. Perkins, Oakdene, Holmwood, Surrey:—Mrs. J. L. Trask, The Cottage, Sparsholt, Winchester:—C. C. Tudway, Walcombe Dairy, Wells, Somerset:—and W. Wood, Moat Farm, Edenbridge, Kent.

C.—Mrs. M. Custance, Woodlands, Southwater, Horsham:—J. E. A. W. Fleming, Chilworth Manor, Romsey:—J. Jeffreys, Canterton Manor, Lyndhurst:—H. McCalmont, M.P., Bishopswood, Ross:—R. Osmond, Weston, Lambourne, Berks:—Mrs. A. Savory, Aldington Manor, Evesham:—and Col. F. Willan, Thorn Hill Park, Bitterne.

CLASS 162.—3 *lbs. of Fresh (or very slightly salted) Butter, in pound rolls or brick shapes, made by a Student who has attended a course of instruction at any Butter School conducted by the Society or by a County Council.* [24 entries.]

I. (£5.)—Miss M. Barker, Fairthorne Grange, Botley, Hants.

II. (£3.)—J. Alexander, Aldermaston Court, Reading.

III. (£2.)—Mrs. A. B. Gale, Downside Farm, Cobham, Surrey.

IV. (£1.)—Mrs. A. Savory, Aldington Manor, Evesham.

R. & V. H. C.—Miss G. Lawrence, Home Dairy Farm, Dinder, Wells, Somerset.

V. H. C.—Miss E. Hayward, Blenheim Dairy, Woodstock.

H. C.—Miss M. J. Williams, Regilbury Park, Winford.

CLASS 163.—3 *lbs. of Fresh (or very slightly salted) Butter, in pound rolls or brick shapes, made from Scalded Cream.* [24 entries.]

I. (£5) and Special (£1.)*—Lord Poltimore, Poltimore Park, Exeter.

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* Three Special Prizes of 1*l.* each were given for Butter, which had the best keeping qualities, exhibited in Class 160, 161, 162, 163, or 164. 1 lb. was taken on the first day of the Show from each Prize Lot of Butter in the Classes named, and was judged on the last day of the Show.

II. (£3.)—J. C. Forster, Clatford Mills, Andover.

III. (£2.)—A. Gibbs, Tyntesfield, Bristol.

IV. (£1.)—Mrs. McIntosh, Havering Park, Essex.

R. & V. H. C.—C. C. Tudway, Walcombe Dairy, Wells, Somerset.

V. H. C.—C. E. Keyser, Aldermaston Court, Reading:—and A. F. Somerville, Dinder, Wells, Somerset.

H. C.—C. Hayes, Keyford House Farm, Frome:—and Duke of Marlborough, Blenheim Palace, Woodstock.

C.—J. Williams, Regilbury Park, Winford.

Class 164.—3 *lbs. of Butter, to which no salt whatever has been added, in pound rolls or brick shapes.* [43 entries.]

I. (£5) and Special (£1.)*—Lord Poltimore, Poltimore Park, Exeter.

II. (£3.)—C. E. Keyser, Aldermaston Court, Reading.

III. (£2.)—Mrs. McIntosh, Havering Park, Essex.

IV. (£1.)—Mrs. M. Custance, Woodlands, Southwater, Horsham.

R. & V. H. C.—L. Barlow, Horeham Manor, Horeham Road, Sussex.

V. H. C.—Mrs. C. Cotton, The Mount, Bishopstoke, Hants:—A. Gibbs, Tyntesfield, Bristol:—Dowager Lady Heathcote, Beechwood, Totton, Hants:—A. F. Somerville, Dinder, Wells, Somerset:—and C. C. Tudway, Welcombe Dairy, Wells, Somerset.

H. C.—C. Combe, Cobham Park, Surrey:—C. Hayes, Keyford House Farm, Frome:—Mrs. A. Savory, Aldington Manor, Evesham:—E. Trump, Courtneys, Clyst Hydon, Devon:—Col. F. Willan, Thorn Hill Park, Bitterne:—and J. Williams, Regilbury Park, Winford.

C.—Belgravia Dairy Company, Limited, 4 and 6, Exhibition Road, London, S.W.:—G. H. Cooper, West of England Creamery, Highbridge:—J. E. A. W. Fleming, Chilworth Manor, Romsey:—Mrs. G. Galloway, Whitchurch, Salop:—Hon. A. H. Holland-Hibbert, Munden, Watford, Herts:—R. Ibbotson, The Hawthorns, Knowle, Warwickshire:—J. Jeffreys, Canterton Manor, Lyndhurst:—and R. Osmond, Weston, Lambourn, Berks.

Class 165.—12 *lbs. of Salted Butter, in a jar or crock, delivered to the Secretary four weeks before the Show.* [12 entries.]

I. (£5.)—J. Williams, Regilbury Park, Winford.

II. (£3.)—N. Todd, Okeford Fitzpaine, Blandford.

III. (£2.)—Belgravia Dairy Company, Limited, 4 and 6, Exhibition Road, London, S.W.

IV. (£1.)—A. F. Somerville, Dinder, Wells, Somerset.

R.—Mrs. F. C. Loxton, St. James's Dairy, Bath.

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* Three Special Prizes of 1*l.* each were given for Butter, which had the best keeping qualities, exhibited in Class 160, 161, 162, 163, or 164. 1 lb. was taken on the first day of the Show from each Prize Lot of Butter in the Classes named, and was judged on the last day of the Show.

CLASS 166.—*Four half-pounds of Clotted or Devonshire Cream, packed either in tins or earthen jars.* [12 entries.]

I. (£3.)—H. S. T. BISCOE, Holton Cottage, Oxford.

II. (£2.)—G. H. COOPER, West of England Creamery, Highbridge.

III. (£1.)—M. SETH-SMITH, Colwood, Bolney, Sussex.

R.—Mrs. F. C. LOXTON, St. James's Dairy, Bath.

BUTTER-MAKING COMPETITIONS.

Professional Teachers, Makers or Vendors of Churns, or persons in any way representing the interests of Makers or Vendors of Churns, were not eligible to compete in the Butter-making Classes; and this Regulation was strictly enforced.

A previous winner of the Society's Champion Gold Medal was not eligible to compete in any of the Butter-making Classes.

(These Prizes were awarded for the Best and Largest quantity of Butter made from a given quantity of Cream in the cleanest and most approved method.)

CLASS 167.—*On the first day of the Show, open to any dairymaid (not residing with or employed by her parents) working for wages not exceeding* 20*l. a year.* [9 entries.]

I. (£5.)—Mrs. N. COMER, West of England Creamery, Highbridge, Somerset.

II. (£3.)—Miss J. FOSTER, Oakdene, Holmwood, Surrey.

III. (£2.)—Miss E. M. A. CROOK, Mentmore Dairy, Leighton Buzzard.

IV. (£1.)—Miss L. WALKER, Whittock's End, Dymock.

R.—Mrs. M. VINCENT, Priestlands Dairy, Pennington, Lymington.

H. C.—Mrs. W. H. BARNES, Beechwood Farm, Totton, Southampton:—Miss A. C. COLE, Home Farm, Easton Neston, Towcester:—Miss M. PERRY, Downside College Dairy, Stratton-on-Fosse, near Bath:—and Miss N. THATCHER, Burrington Farm, Burrington, near Bristol.

CLASS 168.—*On the second day of the Show, open only to Students who have attended a course of instruction at any Butter School conducted by the Society, or by a County Council.* [35 entries.]

I. (£5.)—Miss M. K. HARRIS, Brownsell Farm, Stourton Caundle, Blandford.

II. (£3.)—Miss H. BAYNES, Broxted Hall, Dunmow.

III. (£2.)—Miss A. B. WALKER, Dog Kennel Farm, Hitchin.

IV. (£1.)—Miss L. WALKER, Whittock's End, Dymock.

V. (10s.)—Miss C. J. DAY, Manor Farm, Earl's Barton, Northampton.

R. & V. H. C.—Mrs. M. VINCENT, Priestland's Dairy, Pennington, Lymington.

V. H. C.—A. BAYNES, Broxted Hall, Dunmow:—and Miss M. CAMP, Highfield's Farm, Etwall, Derby.

H. C.—Miss E. M. A. Crook, Mentmore Dairy, Leighton Buzzard:—Miss S. A. Watts, Hawk Street Farm, Bromham, Chippenham:—and Miss A. Yeates, Barrow Court Farm, Flax Bourton, Bristol.

C.—Miss M. J. Camp, Highfield's Farm, Etwell, Derby:—Miss A. C. Coles, Home Farm, Easton Neston, Towcester:—Mrs. A. Hodge, Home Farm, Charlton Portbury, Bristol:—Miss G. Lawrence, Home Dairy Farm, Dinder, Wells:—and Miss N. Thatcher, Burrington Farm, Burrington, near Bristol.

Class 169.—*On the third day of the Show, open to any Woman.* [36 entries.]

I. (**£5.**)—Miss M. K. Harris, Brownsell Farm, Stourton Caundle, Blandford.

II. (**£3.**)—Miss M. Perry, Downside College Dairy, Stratton-on-Fosse, Bath.

III. (**£2.**)—Miss M. Camp, Highfield's Farm, Etwall, Derby.

IV. (**£1.**)—Miss H. Baynes, Broxted Hall, Dunmow.

V. (**10s.**)—Mrs. A. Hodge, Home Farm, Charlton, Portbury, Bristol.

R. & V. H. C.—Miss L. Walker, Whittock's End, Dymock.

V. H. C.—Miss M. J. Camp, Highfield's Farm, Etwall, Derby.

H. C.—Miss M. Clandy, The Mount, Dinas Powis, Cardiff:—Miss A. C. Coles, Home Farm, Easton Neston, Towcester:—Miss E. G. Cook, Clock House Farm, Ashford, Staines:—Miss E. M. A. Crook, Mentmore Dairy, Leighton Buzzard:—Miss N. Thatcher, Burrington Farm, Burrington, near Bristol:—Miss A. B. Walker, Dog Kennel Farm, Hitchin:—and Miss A. Yeates, Barrow Court Farm, Flax Bourton.

C.—Mrs. N. Comer, West of England Creamery, Highbridge:—Miss C. J. Day, Manor Farm, Earl's Barton, Northampton:—and Mrs. F. C. Loxton, St. James's Dairy, Bath.

Class 170.—*On the fourth day of the Show, open to any Man or Woman, except the Winner of the 1st Prize in Class* 169. [32 entries.]

I. (**£5.**)—A. Baynes, Broxted Hall, Dunmow.

II. (**£3.**)—Miss A. B. Walker, Dog Kennel Farm, Hitchin.

III. (**£2.**)—Miss H. Baynes, Broxted Hall, Dunmow.

IV. (**£1.**)—Mrs. N. Comer, West of England Creamery, Highbridge, Somerset.

V. (**10s.**)—Miss M. J. Camp, Highfield's Farm, Etwall, Derby.

R. & V. H. C.—Miss M. Camp, Highfield's Farm, Etwall, Derby.

V. H. C.—Mrs. M. Bath, Lutsey Farm, Worton, Devizes:—and Miss A. Yeates, Barrow Court Farm, Flax Bourton.

H. C.—Miss B. Adlam, Bishopswood, Ross:—Miss M. Clandy, The Mount, Dinas Powis, Cardiff:—Miss F. M. Cole, Home Farm, Tring, Herts:—Miss A. C. Coles, Home Farm, Easton Neston, Towcester:—Miss E. M. A. Crook, Mentmore Dairy, Leighton Buzzard:—Mrs. W. Green, Taylor's Creamery, Christchurch, Hants:—and Miss L. Walker, Whittock's End, Dymock.

C.—Miss E. G. Cook, Clock House Farm, Ashford, Staines:—Mrs. A. Hodge, Home Farm, Charlton, Portbury, Bristol:—Mrs. F. C. Loxton, St. James's Dairy, Bath:—Miss A. M. Tebbutt, Bluntisham, near St. Ives:—and Miss S. A. Watts, Hawk Street Farm, Bromham, Chippenham.

CHAMPION PRIZES.

On the fifth day of the Show the Winners of Prizes in Classes 167, 168, 169, *and* 170 *competed for*:—

I. (A Gold Medal, and the Society's Certificate.)—Miss M. Camp.

II. (A Silver Medal, and the Society's Certificate.)—Miss H. Baynes.

III. (A Bronze Medal, and the Society's Certificate.)—Mr. M. J. Camp.

R. & V. H. C.—Miss C. J. Day.

All other Competitors **V. H. C.**

MILKING COMPETITION.

Class 171.—*On the fourth day of the Show, for Men twenty years of age and over.* [5 entries.]

I. (£1 10s.)—W. H. Barnes, Beechwood Farm, Totton, Southampton.

II. (£1.)—C. Roberts, Southdown Farm, Medstead, Hants.

R.—W. Carter, Blenheim, Oxon.

Class 172.—*On the third day of the Show, for Women.* [4 entries.]

I. (£1 10s.).—Miss M. Nisbet, Great Blunts, Ingatestone, Essex.

II. (£1.)—Miss L. Emmett, Home Farm, Eastleigh.

R.—Miss M. Haggett, Elm Farm, Pilton, Shepton Mallet.

C.—Miss A. C. Coles, The Home Farm, Easton Neston, Towcester.

Class 173.—*On the second day of the Show, for Youths under twenty years of age.* [2 entries.]

I. Equal (£1 5s.)—J. Nisbet, Great Blunts, Ingatestone, Essex:—and A. Young, Harold's Park, Nazeing, Essex.

DAIRY APPLIANCE.

Class 174.—*A Gold Medal was offered for the best Acidimeter.*

The following were to be regarded as essential points in deciding upon the merits of the Exhibits in Class 174:—Efficiency; simplicity of construction; adaptability to the testing of milk and milk products; and economy in cost.

[No Entry.]

HORSE-SHOEING COMPETITION.

The Registration Committee of the Farriers' Company admitted the Winners of First Prizes in these Competitions to the Official Register *free of charge*, on their satisfying the Judges that they had a fair knowledge of the structure of the horse's foot, and on the necessary application being made to the Company in the prescribed form.

CLASS 175.—*Best Shoeing of a Nag Horse by a Smith on the third day of the Show.* [30 entries.]

I. (£5.)—T. HOLLEY, Sway, Lymington, Hants.

II. (£3.)—D. LLOYD, Dolygarreg Lodge, Llanwrda, South Wales.

III. (£2.)—T. RUDGE, Lymington, Hants.

IV. (£1.)—H. KERSLAKE, R.S.S., Williton, Taunton.

R. & V. H. C.—F. MAY, R.S.S., Oaks Road, Woking, Surrey.

H. C.—T. H. FATHERS, Crowle, Worcester:—and T. KERR, R.S.S., Twyford, Berks.

C.—W. STANTON, Castle Street, Luton.

CLASS 176.—*Best Shoeing of a Cart Horse by a Smith on the fourth day of the Show.* [26 entries.]

I. (£5.)—H. KERSLAKE, R.S.S., Williton, Taunton.

II. (£3.)—D. LLOYD, Dolygarreg Lodge, Llanwrda, South Wales.

III. (£2.)—W. STANTON, Castle Street, Luton.

IV. (£1.)—F. R. BARNES, North Stoneham, Southampton.

R. & V. H. C.—S. THOMPSON, R.S.S., 19, Cumberland Street, Luton.

H. C.—W. DENNER, Fore Street, Cullompton:—S. W. GALLOP, The Square, Chew Magna:—and T. RUDGE, Lymington, Hants.

SHEEP-SHEARING.

CLASS 177.—*Best Shearing of Two Sheep on the fifth day of the Show by Competitors under sixteen years of age.* [4 entries.]

I. (£2.)—S. DAVID, Pibsbury, near Langport.

II. (£1.)—H. POULTNEY, Congresbury, Somerset.

III. (10s.)—G. POULTNEY, Congresbury, Somerset.

CLASS 178.—*Best Shearing of Two Sheep on the fifth day of the Show by Competitors of sixteen and under twenty years of age.* [2 entries.]

I. (£3.)—C. NORRIS, Bowers Hill, Somerton.

II. (£2.)—E. DAVID, Pibsbury, near Langport.

CLASS 179.—*Best Shearing of Two Sheep on the fifth day of the Show by Competitors twenty years of age and over.* [13 entries.]

I. (£4.)—F. T. BURT, Long Sutton, Langport.

II. (£3.)—W. SWATRIDGE, Long Sutton, Langport.

III. (£2.)—W. M. DAVID, Pibsbury, Langport.

IV. (£1.)—J. HOLLAND, Long Sutton, near Langport.

R. & V. H. C.—J. E. NEWMAN, Bottom Farm, North Church, Berkampsted.

H. C.—T. PHILLIPS, Farm Stowey, Bridgwater.

C.—W. DAVID, Pibsbury, near Langport:—and W. STARK, Horridge Farm, Ashford, near Barnstaple.

POULTRY.

CLASS 1.—COCHIN, COCK. [5 entries.]

I. (£1 10s.)—J. C. SHUFFREY.

II. (15s.)—Miss M. J. MARSHALL.

V. H. C.—R. HOLLAND.

CLASS 2.—COCHIN, HEN. [4 entries.]

I. (£1 10s.)—Miss M. J. MARSHALL.

II. (15s.)—J. C. SHUFFREY.

V. H. C.—R. HOLLAND.

CLASS 3.—BRAHMA, COCK. [7 entries.]

I. (£1 10s.)—R. W. WEBSTER.

II. (15s.)—S. W. THOMAS.

III. (10s.)—Mrs. M. L. SPERLING.

V. H. C.—G. H. HENSHALL:—and V. G. HUNTLEY.

CLASS 4.—BRAHMA, HEN. [9 entries.]

I. (£1 10s.)—R. W. WEBSTER.

II. (15s.)—R. W. WEBSTER.

III. (10s.)—R. HOLLAND.

V. H. C.—BOSLEY and LAYTON:—and S. J. SOUTHON.

H. C.—S. W. THOMAS.

CLASS 5.—LANGSHAN, COCK. [10 entries.]

I. (£1 10s.)—C. SEABROOKE.

II. (15s.)—G. FIELDER.

III. (10*s.*)—A. Le Cornu.

V. H. C.—W. H. Booth :—and W. J. Oliver.

H. C.—W. B. White.

Class 6.—LANGSHAN, HEN. [5 entries.]

I. (£1 10*s.*)—C. Seabrooke.

II. (15*s.*)—H. Wallis.

V. H. C.—W. H. Crane :—and H. Wallis.

Class 7.—PLYMOUTH ROCK, COCK. [8 entries.]

I. (£1 10*s.*)—Matthews Bros.

II. (15*s.*)—A. and S. Donkin.

III. (10*s.*)—J. Sandercock.

V. H. C.—W. E. Dainton :—and A. Poly-Didier.

H. C.—J. Wheeler.

Class 8.—PLYMOUTH ROCK, HEN. [11 entries.]

I. (£1 10*s.*)—A. Poly-Didier.

II. (15*s.*)—Matthews Bros.

III. (10*s.*)—T. A. Parry.

V. H. C.—T. W. Darby :—A. and S. Donkin :—and A. Poly-Didier.

H. C.—W. E. Dainton.

Class 9.—WYANDOTTE, COCK. [13 entries.]

I. (£1 10*s.*)—Boaden and Thomas.

II. (15*s.*)—Boaden and Thomas.

III. (10*s.*)—Mrs. Pierson.

V. H. C.—T. Doult :—and Rev. C. H. Owen.

H. C.—W. A. and R. F. Spencer :—and W. Titt.

Class 10.—WYANDOTTE, HEN. [7 entries.]

I. (£1 10*s.*)—Boaden and Thomas.

II. (15*s.*)—Maynard and Ratcliffe.

III. (10*s.*)—W. Titt.

V. H. C.—Mrs. Pierson :—and W. A. and R. F. Spencer.

Class 11.—ORPINGTON, COCK. [16 entries.]

I. (£1 10*s.*)—J. Reeves.

II. (15*s.*)—W. Cook and Sons.

III. (10*s.*)—W. Pickard.

V. H. C.—W. Cook and Sons :—R. de C. Peele :—T. Venvells :—an T. Venvells.

CLASS 12.—ORPINGTON, HEN. [10 entries.]

I. (**£1 10**s.)—W. COOK and SONS.

II. (**15**s.)—J. REEVES.

III. (**10**s.)—W. PICKARD.

V. H. C.—W. COOK and SONS:—W. PICKARD:—H. M. POLLETT:—and R. WHITFIELD.

CLASS 13.—MINORCA, COCK. [4 entries.]

I. (**£1 10**s.)—H. HILL.

II. (**15**s.)—FURSLAND BROS.

V. H. C.—W. H. STOYEL.

CLASS 14.—MINORCA, HEN. [8 entries.]

I. (**£1 10**s.)—FURSLAND BROS.

II. (**15**s.)—D. W. LEWIS.

III. (**10**s.)—W. H. STOYEL.

V. H. C.—J. W. CROSSMAN:—L. HAKE:—and J. C. LAMACRAFT.

CLASS 15.—LEGHORN, COCK. [3 entries.]

I. (**£1 10**s.)—Mrs. SINKINS.

II. (**15**s.)—WADE BROS.

V. H. C.—Dr. A. G. MOSSOP.

CLASS 16.—LEGHORN, HEN. [5 entries.]

I. (**£1 10**s.)—Mrs. SINKINS.

II. (**15**s.)—WADE BROS.

V. H. C.—J. C. LAMACRAFT:—and Dr. A. G. MOSSOP.

CLASS 17.—HAMBURG, COCK. [2 entries.]

I. (**£1 10**s.)—H. PICKLES.

V. H. C.—H. W. HANGER.

CLASS 18.—HAMBURG, HEN. [2 entries.]

I. (**£1 10**s.)—H. W. HANGER.

V. H. C.—H. PICKLES.

CLASS 19.—DORKING (COLOURED), COCK. [10 entries.]

I. (**£1 10**s.)—MAYNARD and RATCLIFFE.

II. (**15**s.)—T. HULSE.

III. (**10**s.)—H. REEVES.

V. H. C.—A. LUCKIN:—and W. V. H. THOMAS.

H. C.—A. LUCKIN.

Class 20.—DORKING (Coloured), HEN. [8 entri

I. (£1 10s.)—H. Reeves.
II. (15s.)—A. Luckin.
III. (10s.)—H. Meredith.
V. H. C.—Mrs. J. Hebditch.
H. C.—Maynard and Ratcliffe.

Class 21.—DORKING (Silver Grey), COCK. [7 ent

I. (£1 10s.)—O. E. Cresswell.
II. (15s.)—H. Reeves.
III. (10s.)—H. Meredith.
H. C.—O. E. Cresswell.

Class 22.—DORKING (Silver Grey), HEN. [7 en

I. (£1 10s.)—O. E. Cresswell.
II. (15s.)—J. Paterson.
III. (10s.)—O. E. Cresswell.
V. H. C.—Mrs. M. L. Sperling.
H. C.—J. Blundell:—and H. Reeves.

Class 23.—DORKING (White or Cuckoo), COCK. [4

I. (£1 10s.)—S. W. Bennett, *white.*
II. (15s.)—O. E. Cresswell.
H. C.—O. E. Cresswell:—and J. J. G. Woodcock, *white.*

Class 24.—DORKING (White or Cuckoo), HEN. [6

I. (£1 10s.)—J. J. G. Woodcock, *white.*
II. (15s.)—O. E. Cresswell.
III. (10s.)—O. E. Cresswell.
V. H. C.—S. W. Bennett, *white.*
H. C.—H. Reeves.

Class 25.—OLD ENGLISH GAME, COCK. [6 ent

I. (£1 10s.)—W. Nixon.
II. (15s.)—O. Priaulse.
III. (10s.)—O. Priaulse.
H. C.—Rev. R. F. Maynard:—and G. Roper.

Class 26.—OLD ENGLISH GAME, HEN. [6 ent

I. (£1 10s.)—J. T. Organ.
II. (15s.)—W. Nixon.

III. (**10***s.*)—Rev. R. F. Maynard.

V. H. C.—G. Roper.

H. C.—O. Priaulse.

Class 27.—INDIAN GAME, COCK. [8 entries.]

I. (**£1 10***s.*)—John Frayn.

II. (**15***s.*)—James Frayne.

III. (**10***s.*)—H. Paynter.

V. H. C.—W. H. Brading.

H. C.—T. Turner.

Class 28.—INDIAN GAME, HEN. [6 entries.]

I. (**£1 10***s.*)—John Frayn.

II. (**15***s.*)—James Frayne.

III. (**10***s.*)—W. Brent.

V. H. C.—H. Paynter.

H. C.—W. J. Oliver.

Class 29.—MALAY, COCK. [3 entries.]

I. (**£1 10***s.*)—J. C. Huxtable.

II. (**15***s.*)—J. R. R. Mitchell.

V. H. C.—John Frayn.

Class 30.—MALAY, HEN. [3 entries.]

I. (**£1 10***s.*)—J. C. Huxtable.

II. (**15***s.*)—John Frayn.

V. H. C.—R. Parkhouse.

Class 31.—FRENCH, COCK. [6 entries.]

I. (**£1 10***s.*)—F. Valpy, *La Fleche.*

II. (**15***s.*)—S. W. Thomas.

III. (**10***s.*)—J. Hill, *Houdan.*

H. C.—S. W. Thomas.

Class 32.—FRENCH, HEN. [8 entries.]

I. (**£1 10***s.*)—F. Valpy, *La Fleche.*

II. (**15***s.*)—F. Valpy, *Houdan.*

III. (**10***s.*)—S. W. Thomas.

H. C.—Mrs. C. Hill and Mrs. Maconochie, *Houdan*:—Mrs. C. Hill nd Mrs. Maconochie, *Houdan*:—Miss F. A. Roberts, *Houdan*:—and S. W. homas.

Class 33.—ANY OTHER DISTINCT BREED (not previously mentioned), COCK. [8 entries.]

I. (**£1 10***s.*)—T. Turner, *Poland.*

II. (**15***s.*)—C. Payne, *Game.*

III. (10*s.*)—G. Podger, *Spanish.*

H. C.—V. G. Huntley.

C.—F. Stoodley, *Dominique.*

Class 34.—ANY OTHER DISTINCT BREED (not previously mentioned), HEN. [9 entries.]

I. (£1 10*s.*)—F. Stoodley, *Dominique.*

II. (15*s.*)—T. Turner, *Poland.*

III. (10*s.*)—L. Hake, *Spanish.*

H. C.—G. C. Day, *black red Game*:—and V. G. Huntley.

CHICKENS OF 1897.

Class 35.—COCHIN, BRAHMA, LANGSHAN, PLYMOUTH ROCK, WYANDOTTE, OR ORPINGTON, COCKEREL. [11 entries.]

I. (£1 10*s.*)—Boaden and Thomas, *Wyandotte*, Jan.

II. (15*s.*)—R. de C. Peele, *Orpington*, Jan. 5th.

III. (10*s.*)—R. Holland, Jan. 3rd.

H. C.—W. E. Dainton, *Plymouth Rock*:—Mrs. B. V. Dawes, *silver Wyandotte*, Jan. 22nd:—A. and S. Donkin, Jan. 15th:—L. and T. Fawkes, *Plymouth Rock*, Jan. 5th:—and J. Wheeler, *Plymouth Rock*, Jan. 12th.

Class 36.—COCHIN, BRAHMA, LANGSHAN, PLYMOUTH ROCK, WYANDOTTE, OR ORPINGTON, PULLET. [12 entries.]

I. (£1 10*s.*)—C. J. Else, *silver Wyandotte*, Jan. 2nd.

II. (15*s.*)—R. Holland, Jan. 15th.

III. (10*s.*)—J. Wheeler, *Plymouth Rock*, Jan. 12th.

Class 37.—MINORCA, LEGHORN, HAMBURG, OR FRENCH, COCKEREL. [6 entries.]

I. (£1 10*s.*)—W. T. Lambert, *white Leghorn*, Jan. 17th.

II. (15*s.*)—L. and T. Fawkes, *Minorca*, Jan. 12th.

III. (10*s.*)—A. Ransom, *Leghorn*, Jan. 2nd.

Class 38.—MINORCA, LEGHORN, HAMBURG, OR FRENCH, PULLET. [5 entries.]

I. (£1 10*s.*)—L. and T. Fawkes, *Minorca*, Jan. 12th.

II. (15*s.*)—A. Ransom, *Leghorn*, Jan. 2nd.

H. C.—W. T. Lambert, *white Leghorn*, Jan. 17th:—and Mrs. Lister-Kay, *Leghorn*, Jan.

Class 39.—DORKING, GAME, MALAY, OR ANY OTHER DISTINCT BREED (not previously mentioned), COCKEREL. [5 entries.]

I. (£1 10*s.*)—H. Reeves, *Dorking*, Jan. 1st.

II. (15*s.*)—C. Luckin, *Dorking*, Jan. 12th.

Class 40.—DORKING, GAME, MALAY, OR ANY OTHER DISTINCT BREED (NOT PREVIOUSLY MENTIONED), PULLET. [8 entries.]

I. (£1 10s.)—J. Blundell, *Dorking*, Jan. 2nd.

II. (15s.)—James Frayne, *Indian Game*, Jan. 9th.

III. (10s.)—A. H. Skoyles, *Old English Game*, Jan. 27th.

H. C.—H. Reeves, *Dorking*, Jan. 1st.

LIVE TABLE POULTRY.

Class 41.—PAIR OF COCKERELS OF 1897, OF ANY PURE BREED. [7 entries.]

I. (£1 10s.) and Special.*—W. Brent, *Indian Game*. Jan. or Feb.

II. (15s.)—H. Reeves, *Dorkings*, Jan. 1st.

III. (10s.)—W. R. Crofton, *white Dorkings*, Jan.

C.—J. W. Gore, *Dorkings*, Jan. 5th.

Class 42.—PAIR OF PULLETS OF 1897, OF ANY PURE BREED. [6 entries.]

I. (£1 10s.)—A. Stone, *Indian Game*, Jan. 3rd.

II. (15s.)—H. Reeves, *Dorkings*, Jan. 1st.

III. (10s.)—W. R. Crofton, *white Dorkings*, Feb.

H. C.—W. Brent, *Indian Game*, Jan. or Feb.

Class 43.—PAIR OF COCKERELS OF 1897, OF A FIRST CROSS FROM ANY PURE BREEDS. [5 entries.]

I. (£1 10s.)—F. Read, *Indian Game-Dorking*, Feb. 1st.

II. (15s.)—W. R. Crofton, *White Dorking-Redcap*, Jan.

III. (10s.)—H. Hill, *Indian Game-Dorking*.

C.—Miss M. Dolben, *Old English Game-Dorking*, Jan. 6th.

Class 44.—PAIR OF PULLETS OF 1897, OF A FIRST CROSS FROM ANY PURE BREEDS. [5 entries.]

I. (£1 10s.)—W. R. Crofton, *Creve-Dorking*, Jan.

II. (15s.)—W. Abrey, *Indian Game-Dorking*, Jan. 15th.

H. C.—H. Hill, *Indian Game-Dorking*:—and C. Luckin, *Dorking-Indian Game*.

SELLING CLASSES.

Class 45.—ANY DISTINCT BREED, COCK (Price not to exceed £1 1s.). [16 entries.]

I. (£1 10s.)—J. England, *Orpington*.

II. (15s.)—R. W. Webster, *Cochin*.

III. (10s.)—C. Luckin, *Dorking*.

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* A Silver Cup, given by Mr. W. B. Tegetmeier, for the Best Pair of Cockerels or Pullets in Class 41, 42, 43, or 44.

V. H. C.—V. G. Huntley:—H. Lake, *Plymouth Rock*:—A. Luckin, *Dorking*:—and Maynard and Ratcliffe.

H. C.—H. Paynter, *Indian Game.*

Class 46.—ANY DISTINCT BREED, HEN (Price not to exceed £1 1s.). [11 entries.]

I. (£1 10s.)—H. Hill.

II. (15s.)—H. Reeves, *Dorking.*

III. (10s.)—J. C. Lamacraft.

V. H. C.—Bosley and Layton, *light Brahma*:—and H. J. Gibbs, *Indian Game.*

H. C.—W. E. Dainton:—C. Luckin, *Dorking*:—and R. W. Webster, *Brahma.*

DUCKS, GEESE, AND TURKEYS.

Class 47.—DRAKE OR DUCK (Aylesbury). [6 entries.]

I. (£1 10s.)—S. H. Brown.

II. (15s.)—F. Read.

III. (10s.)—Mrs. B. Radclyffe.

H. C.—A. Brown.

Class 48.—DRAKE OR DUCK (Rouen). [13 entries.]

I. (£1 10s.)—V. G. Huntley.

II. (£15s.)—V. G. Huntley.

III. (10s.)—W. Cook and Sons.

V. H. C.—S. H. Brown:—and W. H. Gulliver.

H. C.—W. Bygott.

Class 49.—DRAKE OR DUCK (Pekin). [9 entries]

I. (£1 10s.)—J. F. Hill.

II. (15s.)—T. Allen.

III. (10s.)—J. R. R. Mitchell.

V. H. C.—S. H. Brown.

H. C.—S. H. Brown.

Class 50.—GANDER. [3 entries.]

I. (£1 10s.)—H. T. Goodenough, *Embden.*

II. (15s.)—Mrs. J. Hebditch, *Toulouse.*

Class 51.—GOOSE. [3 entries.]

I. (£1 10s.)—W. G. Watson.

II. (15s.)—H. T. Goodenough, *Embden.*

Class 52.—TURKEY, COCK. [9 entries.]

I. (£1 10s.)—W. Stanford.

I. (**15***s.*)—Miss M. B. St. John.
II. (**10***s.*)—Mrs. B. Radclyffe.
V. H. C.—Mrs. R. Ashford:—and J. F. Hill.
H. C.—H. T. Goodenough:—G. Harper:—and Mrs. E. E. Henshaw.

Class 53.—TURKEY, HEN. [6 entries.]

I. (**£1 10***s.*)—W. Stanford.
II. (**15***s.*)—J. R. R. Mitchell.
III. (**10***s.*)—H. T. Goodenough.
V. H. C.—T. Rogers.

DEAD TABLE POULTRY.

Forwarded alive, and killed and plucked by a Poulterer employed by the Society.)

Class 54.—PAIR OF COCKERELS OF 1897, OF ANY PURE BREED. [3 entries.]

I. (**£1 10***s.*)—H. Reeves, *Dorkings*, Jan.
II. (**15***s.*)—W. E. Dainton, *Plymouth Rocks*, Jan. 14th.
H. C.—W. R. Crofton, *white Dorkings*, Feb.

Class 55.—PAIR OF PULLETS OF 1897, OF ANY PURE BREED. [1 entry.]

I. (**£1 10***s.*)—C. Luckin, *Dorkings*, Jan. 20th.

Class 56.—PAIR OF COCKERELS OF 1897, OF A FIRST CROSS FROM ANY PURE BREEDS. [5 entries.]

I. (**£1 10***s.*)—C. Luckin, *Dorking-Indian Game*, Feb. 3rd.

Class 57.—PAIR OF PULLETS OF 1897, OF A FIRST CROSS FROM ANY PURE BREEDS. [2 entries.]

I. (**£1 10***s.*)—Manor Poultry Farm, *Indian Game-Dorking*, Jan.
H. C.—C. Luckin, *Dorking-Indian Game*, Feb. 3rd.

Class 58.—PAIR OF DUCKLINGS OF 1897. [6 entries.]

I. (**£1 10***s.*) and Special.*—F. Read, *Aylesbury*, March 21st.
II. (**15***s.*)—H. Hill, *Aylesbury* and *Pekin.*
III. (**10***s.*)—Mrs. Hebditch, *Aylesbury*, March 12th.
H. C.—H. Hill, *Aylesbury* and *Pekin.*

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* A Silver Cup, given by Sir Walter Gilbey, Bart., for the Best Pair of ckerels, Pullets, or Ducklings in Class 54, 55, 56, 57, or 58.

BATH AND WEST AND SOUTHERN COUNTIES SOCIETY.

ART UNION HELD AT SOUTHAMPTON, May 28, 1897.

Prize Ticket.	Value of Prize.		Prize Winner.	Winner's Address.	Name of Picture.	Artist.	Price of Picture.		
	£	s.					£	s.	d.
390	15	15	H. E. Grace ..	110, West Avenue, Oldfield Park, Bath	By the Margin of the Lake ..	Val Davis, R.B.A.	15	15	0
953	10	10	Mrs. E. Kidner ..	Manor House, Cothelstone, Taunton	A Moorland Stream	F. J. Widgery ..	10	10	0
815	10	10	F. W. Millard ..	Hoddesdon, Herts	Roses and Honeysuckle ..	Miss P. Trump ..	8	8	0
					Roses	Miss R. M. Dodd ..	2	0	0
17	10	0	Unclaimed	.. ..	Silver Daylight	R. W. Vernon ..	10	0	0
268	10	0	R. B. Brown ..	Dorchester	Nor Voice, nor Sound	G. D. Hiscox	8	0	0
830	5	5	E. W. Tovey ..	Julian Road, Bath	Exmouth Docks, Devon ..	A. M. Fowwaker ..	3	3	0
					On the East Ockment, near Okehampton	A. J. Couche	2	2	0
1238	5	5	C. W. A. Jellicoe	7, Portland Terrace, Southampton	Long Bridge, Salisbury ..	A. Morris	3	3	0
					Southampton Common ..	Mrs. M. Von E. Moberly	2	2	0
1619	5	5	G. Deeley	Messrs. Webb's, Wordsley ..	Romeo and Juliet	J. FitzMarshall ..	5	5	0
1682	5	5	H. P. Molyneux ..	Bolebec, Streatham	Cattle	G. W. Horler ..	8	8	0
582	5	5	C. L. F. Edwards	The Court, Axbridge	Autumn, Southampton Common	F. R. Offor	5	5	0
28	5	5	J. B. Hill	62, Above Bar, Southampton	Market Place, Ledbury ..	Miss Stevens	5	5	0
387	5	0	J. W. H. Grout ..	Horninglow, Burton-on-Trent	Red House Farm, Surrey ..	W. Ball	5	0	0
1029	5	0	W Jarman	21, Hyde Park Road, Mutley, Plymouth	On the Common	Miss Sells	5	0	0

322	4	4	C. L. Bourlet	17, Nassau Street, London	Low Tide, Scarborough	W. A. Thornbury	4	4	0
1436	4	4	Miss M. Wilson	Court Oak, Chieveley, Newbury	Spring	Mrs. E. Berkeley	4	4	0
1240	4	4	J. E. Hammond	4, Above Bar, Southampton	Sunset on the Exe	H. S. Jackson	4	0	0
1219	3	3	Miss White	Royal Hotel, Southampton	Beaulieu River, Hants On the Avon, near Salisbury	Miss S. D'Elboux J. T. Wells	2 1	2 1	0 0
1193	3	3	S. Holley	17, High East Street, Dorchester	On the River, near Haddington, N.B.	Miss C. L. Davis	3	3	0
141	3	3	J. Cann	44, Okehampton Street, St. Thomas, Exeter	Evaline at the Rectory	Miss A. Hunter	3	3	0
1116	3	3	W. H. Bastick	16, Above Bar, Southampton	Evening, Strand Study	J. J. Dillon	3	3	0
726	3	3	A. Harper	Ebley, Stroud	Primroses Daffodils	Mrs. J. T. Pengelly	1 1	10 10	0 0
697	2	2	E. W. Williams	Herringston, Dorchester	A Summer Morning	Mrs. P. de Crespigny	3	3	0
1699	2	2	T. F. Plowman	69, Pulteney Street, Bath	At Twyford, Winchester	Miss E. S. A. McMillan	4	4	0
669	2	2	C. Lickfold	35, Above Bar, Southampton	Chrysanthemums	Miss Ham	2	2	0
178	2	2	T. Ash	2, Cowick Road, St. Thomas, Exeter	Kaiser Blume	Miss B. Hunter	2	2	0
1256	2	2	E. C. Blackstone	Stamford	Yorkshire Terrier	Mrs. M. Coote	2	2	0
68	2	2	H. Miller	13, Park Road, Southampton	North Bull, Strand, Co. Dublin	J. J. Dillon	2	12	6
1173	2	2	Miss White	Royal Hotel, Southampton	Floods in the Exe Valley	Miss M. L. Hake	2	2	0
				Unclaimed Prize of	*Previous Year.*				
1574	5	5	Unclaimed		Lowestoft Trawlers	R. W. Vernon	5	5	0

Bath and West and Southern Counties Society.

OBJECTS OF THE SOCIETY AND PRIVILEGES OF MEMBERSHIP.

ANNUAL EXHIBITIONS.

The Society annually holds an Exhibition in some city or town in England or Wales. Each section of the Society's district is visited at intervals, so that most Members have an opportunity of seeing the Show in their own neighbourhood every few years. Prizes to a large amount are given for Horses, Cattle, Sheep, Pigs, Farm Produce, &c. Provision is also made for the exhibition of Agricultural Implements and Machinery, Seeds, Cattle Foods, Artificial Manures, and articles of general utility. A substantially-built and completely-equipped Working-Dairy on a large scale is a special feature of these Exhibitions. Here explanatory demonstrations, and comparative tests of implements and processes are carried on with the assistance of well-known practical and scientific experts, and Butter-making Competitions are held. Among other features of the Annual Meeting are Shoeing and Milking Competitions, Poultry and Horticultural Shows, and Exhibitions illustrative of Bee-keeping, Home Industries, Art-Manufactures, and the Fine Arts.

Membership entitles to free admission to the Annual Exhibition, and also to the Grand Stand overlooking the Horse and Cattle Ring, to the Reserved Seats in the Working Dairy, and to the use of the Members' Special Pavilion for Reading, Writing, &c.

Entries can be made by Members (elected on or before the last Tuesday in January preceding the Show) at 10s. per entry for Horses (other than Harness), and 5s. per entry for Cattle, Sheep, and Pigs. Non-Members are required to pay £1 per entry for Horses (other than Harness) and 15s. per entry for the other Stock named. *Similar reductions in the Fees in the Farm Produce, the Poultry, and other Classes are made to Members.*

THE JOURNAL.

All Members receive free of charge the Society's Journal, which is published annually, bound in cloth. It has for its aim the dissemination of agricultural knowledge in a popular form, and in addition to original articles by well-known agricultural authorities, it contains particulars of the Society's general operations, [illegible] reports o[illegible] its experimental and research work, prize awards, financial state[illegible]s. lists [illegible], reviews of new books on agriculture, &c. (The price of [illegible] post free.)

[illegible] AND BOTANICAL FACILITIES.

[illegible] Consulting Chemist (Dr. J. A. Voelcker, M.A., F.I.C., &c.), [illegible] Consulting Botanist (Mr. W. Carruthers, F.R.S.), *from whom Members can* [illegible] *reduced rates of charge.*

[illegible]MENTS.

[illegible] at experimental stations in various parts [illegible] *Members are enabled to take part in these and to receive* [illegible]

[illegible] perimental station and laboratory attached to its heese School, and a similar department for carrying on researches in connection ith Cider-making. Here systematic investigations are conducted by a scientific taff, acting in conjunction with practical experts, *detailed reports of which are urnished to Members.*

TECHNICAL EDUCATION.

The Society conducts, on behalf of the Somerset County Council, a Cheese School, where Students are received and boarded, and also a Travelling Farriery School for promoting improvement in the Shoeing of Horses. *Members are admitted free to witness the Teaching and Competitions at any of the Society's Schools.*

FINE ART AND ART-MANUFACTURES.

One of the objects for which the Society was founded was the encouragemen f Arts as well as Agriculture, and, to this end, exhibitions of Paintings an Art-Manufactures are annually held. The special aims of the Society in maintaining this department are:—1st The encouragement of young Artists, especially, and of local efforts to bring art-workmanship to bear in the production of decorative or useful articles. 2nd. The exhibition of such art treasures as there may be in private or other collections, to which the public, ordinarily, have no access. No charge is made to Artists for the exhibitions of their Paintings, nd, in order to promote the sale of meritorious works, an Art Union is held, the rizes for which are selected from the Pictures exhibited, a large sum being nnually voted by the Society towards their purchase.

TERMS OF MEMBERSHIP.

ANNUAL SUBSCRIPTIONS.

Ordinary Members, not less than	£1
Tenant Farmers, the rateable value of whose holdings does not exceed £200 a-year, not less than	10/-

Governors, who are eligible for election as President or Vice-President, and ho subscribe not less than £2, are entitled, in addition to the privileges already entioned, to an extra Season Ticket for the Annual Exhibition and to the rand Stand, &c. Governors subscribing more than £2 are entitled to a further icket for every additional £1 subscribed.

Members subscribing less than £1 are entitled to all the privileges of Memberhip except that of entering Stock at reduced fees, and their admission Ticket or the Annual Show is available for *one day only* instead of for the whole time f the Exhibition.

LIFE COMPOSITIONS.

Governors may compound for their Subscriptions for future years by payment, n advance, of £20; and Members by payment, in advance, of £10. Governors nd Members who have subscribed for 20 years may become Life-Members on ayment of half these amounts.

Any person desirous of joining the Society can be proposed by a Member, r by

THOS. F. PLOWMAN,
Secretary and Editor,

4, Terrace Walk, Bath.

Telegraphic Address:—"PLOWMAN, BATH."

Bath and West and Southern Counties Society.

GENERAL LAWS,

As revised in accordance with the Report of a Special Committee; which Report was received and adopted by the Annual General Meeting of Members, held on May 30, 1895.

COMPOSITION OF THE SOCIETY.

I. The Society shall consist of a President, Vice-Presidents, Trustees, Council, Treasurer, Secretary, and Members.

OBJECTS.

II. The Society shall have the following objects:—

a. To hold Exhibitions of breeding stock, agricultural implements, and such other articles connected with agriculture, arts, manufactures or commerce as may be determined upon by the Council.
b. To conduct practical and scientific investigations in agriculture.
c. To promote technical education in agriculture by providing means of systematic instruction.
d. To publish a Journal for circulation.

SUBSCRIPTIONS.

III. The Annual Subscriptions for Members shall be as follows:—

Governors (who are eligible for election as President or Vice-President) not less than	£2
Ordinary Members, not less than	£1
Tenant Farmers (the rateable value of whose holding does not exceed £200 a-year) not less than	10/-

IV. The payment of £20 in one sum shall constitute a Governor for life, and of £10 in one sum an Ordinary Member for life; but any Governor who has subscribed not less than £2 annually for a period of twenty years may become a life Governor on the further payment of £10 in one sum; and any Ordinary Member, who has subscribed not less than £1 annually for the same period, may become a Life-Member on the further payment of £5 in one sum.

V. Subscriptions shall become due and be payable in advance on the 1st of January in each year or as soon as the Subscriber has been elected a Member. When the election takes place during the last quarter of the year the subscription payable on election will be considered as applying to the ensuing year.

VI. A Member shall be liable to pay his subscription for the current year unless he shall have given notice, in writing, to the Secretary before January 1st of his intention to withdraw.

GOVERNING BODY.

VII. The entire management of the Society—including the making of Bye-laws, election of Members, determining the Prizes to be awarded, appointing Committees, fixing the Places of Meetings and Exhibitions, appointing or removing the Treasurer, Secretary, and such other officers as may be required to carry on the business of the Society—shall be vested in the Council, who shall report its proceedings at the annual meetings of the Society.

VIII. The Council shall consist of the Patron (if any), President, Vice-Presidents, Trustees, and Treasurer (who shall be *ex-officio* Members), and of sixty-six elected Members.

ELECTION OF PRESIDENT, VICE-PRESIDENTS, TRUSTEES, AND COUNCIL.

IX. The election of a President for the year, of any additional Vice-President, of Trustees, and of the Members of Council representing the Divisions named in Law X., shall take place at the Annual Meeting of the Society, and they shall enter into office at the conclusion of the Exhibition during which such Annual Meeting has been held.

X. The sixty-six Members of the Council referred to in Laws VIII. and IX. shall consist of fifty-eight persons residing or representing property in the following Divisions, viz.:—

Twelve from the Counties of Devon and Cornwall, which shall be called the Western Division;
Twenty-four from the Counties of Somerset, Dorset, and Wilts, which shall be called the Central Division;
Twelve from the Counties of Hants, Berks, Oxon, Bucks, Middlesex, Surrey, Sussex, and Kent, which shall be called the Southern Division; and
Ten from the Counties of Worcester, Gloucester, Hereford and Monmouth, and the Principality of Wales, which shall be called the North-Western Division.

The remaining eight shall be elected (irrespective of locality) from the general body of Members, and shall form a Division which shall be called the "Without Reference to District" Division.

XI. One half of the elected Members in each of the five Divisions named in Law X. shall retire annually by rotation, but shall be eligible for re-election.

XII. The Council shall have power to nominate a President, Vice-Presidents, Trustees, and Members of Council for the approval of the annual meeting, and to fill up such vacancies in their own body as are left after the annual meeting, or as may from time to time occur during the interval between the annual meetings.

XIII. Nominations to offices, election to which is vested in the whole body of Members, must reach the Secretary ten days before the meeting at which such vacancies are to be filled up.

MEETINGS.

XIV. The Annual Meeting of the Society shall take place during the holding of the annual Exhibition.

XV. Special general meetings of the Society may be convened by the President on the written requisition of not less than three Members of Council; and all Members shall have ten days' notice of the object for which they are called together.

XVI. No Member of less than three months' standing, or whose subscription is in arrear, shall be entitled to vote at a meeting.

EXHIBITIONS.

XVII. The annual Exhibitions of the Society shall be held in different Cities or Towns in successive years.

XVIII. All Exhibitors shall pay such fees as may be fixed by the Council. Members subscribing not less than £1 per annum, who have been elected previous to February 1st, and have paid the subscription for the current year, shall be entitled to exhibit at such reduction in these fees as the Council shall determine.

PRIZES.

XIX. All prizes offered at the cost of the Society shall be open for competition to the United Kingdom.

XX. No person intending to compete for any prize offered at the annual Exhibition shall be eligible to act as a judge or to have any voice in the selection of judges to award the premiums in the department in which he exhibits.

XXI. If it be proved to the satisfaction of the Council that any person has attempted to gain a prize in this, or in any other Society, by a false certificate or by a misrepresentation of any kind, such person shall thereupon be for the future excluded from exhibiting in this Society.

JOURNAL.

XXII. The Proceedings of the Society, Awards of Prizes, Financial Statements, and List of Officers, Governors and Members shall be printed annually in the Society's Journal, and every Governor and Member, not in arrear with his subscription, shall be entitled to receive one copy, free of expense, and there shall be an additional number printed for sale.

POLITICS.

XXIII. No subject or question of a political tendency shall be introduced at any meeting of this Society.

ALTERATIONS IN LAWS.

XXIV. No new General Law shall be made or existing one altered, added to or rescinded, except at an annual or special general meeting, and then only provided that a statement of particulars, in writing, shall have been sent to the Secretary at least twenty-one days previous to the meeting at which the question is to be considered.

List of Officers.

1897–98.

CARDIFF MEETING.

PATRON.

HIS ROYAL HIGHNESS THE PRINCE OF WALES, K.G.

PRESIDENT FOR 1897–98.

IE RIGHT HON. THE LORD WINDSOR, Hewell Grange, Bromsgrove.

TRUSTEES.

*ACLAND, THE RIGHT HON. SIR THOMAS DYKE, Bart., Killerton, Exeter.

PAGET, THE RIGHT HON. SIR RICHARD HORNER, Bart., Cranmore Hall, Shepton Mallet.

LENNARD, SIR JOHN FARNABY, Bart., Wickham Court, West Wickham, Kent.

VICE-PRESIDENTS.

YORK, H.R.H. THE DUKE OF, K.G.	York House, London, S.W.
*ACLAND, RIGHT HON. SIR T. D., Bart.	Killerton, Exeter
ACLAND, C. T. D.	Holnicote, Taunton
*AMHERST, EARL	Montreal, Sevenoaks, Kent
BATH, MARQUESS OF	Longleat, Warminster
BELFIELD, JOHN	Primley Hill, Torquay
BRYMER, W. E., M.P.	Ilsington House, Dorchester
*CLARENDON, EARL OF	The Grove, Watford
*CLINTON, LORD	Heanton Satchville, Beaford, N. Devon
*CORK AND ORRERY, EARL OF	Marston, Frome
*COVENTRY, EARL OF	Croome Court, Severn Stoke, Worcester
DAW, R. R. M.	Spurbarne, Exeter
DEVONSHIRE, DUKE OF, K.G.	Chatsworth, Derbyshire
DIGBY, G. D. W.	Sherborne Castle, Sherborne
*DUCIE, EARL OF	Tortworth, Falfield, R.S.O.
*FORTESCUE, EARL	Castle Hill, South Molton
GIBBS, A.	Tyntesfield, Bristol
GORING, REV. J.	Wiston Park, Steyning
HIPPESLEY, J. H.	Ston Easton, Somerset
HULSE, SIR E., Bart.	Breamore, Salisbury
*ILCHESTER, EARL OF	Melbury, Dorchester
*JERSEY, EARL OF	Middleton Park, Bicester, Oxon.
KNYFTON, T. TUTTON	Uphill, Weston-super-Mare
*LANSDOWNE, MARQUESS OF, K.G.	Bowood, Calne
LECONFIELD, LORD	Petworth House, Sussex
LENNARD, SIR J. F., Bart.	Wickham Court, West Wickham, Kent
*LLEWELYN, SIR J. T. D., Bart., M.P.	Penllergare, Swansea
*LOPES, SIR M., Bart.	Maristow, Roborough, S. Devon
LOYD, LEWIS	Monk's Orchard, Bromley, Kent
MILDMAY, SIR H. ST. JOHN, Bart.	Dogmersfield Park, Winchfield
*MONTAGU OF BEAULIEU, LORD	Palace House, Beaulieu, Hants
MOORE-STEVENS, J. C.	Winscott, Great Torrington

*** Those to whose names an asterisk (*) is prefixed have filled the office of President.

Vice-Presidents—*continued.*

Moreton, Lord	Sarsden House, Chipping Norton
*Morley, Earl of	Saltram, Plympton, Devon
Morrell, G. Herbert, M.P.	Headington Hill Hall, Oxford
*Mount-Edgcumbe, Earl of	Mount Edgcumbe, Devonport
Neville-Grenville, R.	Butleigh Court, Glastonbury
Northumberland, Duke of	Albury Park, Guildford
*Onslow, Earl of	7, Whitehall Place, London, S.W.
Paget, The Right Hon. Sir R. H., Bart.	Cranmore Hall, Shepton Mallet
Pinney, W.	Somerton
Poltimore, Lord	Poltimore, Exeter
*Portman, Viscount	Bryanston, Blandford
Portal, Melville	Laverstock House, Micheldever, Hants
Saint Germans, Earl of	Port Elliot, Devonport
Skrine, H. D.	Claverton Manor, Bath.
Somerset, Duke of	Maiden Bradley, Bath
Story-Maskelyne, N.	Basset Down House, Swindon
Stucley, Sir G. S., Bart.	Moreton, Bideford, N. Devon
*Temple, Earl	Newton Park, Bath.
Thynne, Lord Henry	Muntham, Worthing
*Tredegar, Lord	Tredegar Park, Newport, Monmouth
*Tremayne, John	Heligan, St. Austell
Walrond, Sir W. H., Bart., M.P.	Bradfield, Cullompton
*Warwick, Earl of	Warwick Castle
Winchester, Marquess of	Amport St. Mary's, Andover

The Lord Warden of the Stannaries.
The Surveyor-General of the Duchy of Cornwall.
The Receiver-General of the Duchy of Cornwall.

⁂ Those to whose names an asterisk (*) is prefixed have filled the office of President.

MEMBERS OF COUNCIL.

EX-OFFICIO MEMBERS.

The Patron	The Treasurer.
The President.	The Consulting Surveyor.
The Vice-Presidents.	

ELECTED MEMBERS.

WESTERN DIVISION (Devon and Cornwall).

(12 *Representatives.*)

Elected in 1896 :—		*Elected in* 1897 :—	
Name.	*Address.*	*Name.*	*Address.*
C. R.. . .	Hartwell House, Exeter	Bolitho, T. B., M.P.	Trerlddeu, Penzance
R. . . .	Combe, Honiton	Dymond, F. W. . .	Bampfylde House, Exeter
, Sir J., Bt. .	Shobrooke Park, Crediton	King, Sir D. Duckworth, Bart . .	Wear House, Exeter
s, Sir W. R., ...	Heanton, Barnstaple	Sanders, E. J. . .	Stoke House, Exeter
, R. . . .	Thorverton, Devon.	Sillifant, A. O.	Coombe, Copplestone
Edgell, Col. A.	Cowley Place, Exeter	Vosper, W. P. . .	Merafield, Plympton

CENTRAL DIVISION (Somerset, Dorset, and Wilts).

(24 *Representatives.*)

J. D. . .	Springfield House, Shepton Mallet	Brown, W. J. . .	Middlehill House, Box, Wilts
L. G. . .	Charlton House, Ludwell, Salisbury	Digby, J. K. W., M.P.	Sherborne Castle, Sherborne
t, E. T. D. .	Hinton Charterhouse, Bath	Dyke, T. . . .	Long Ashton Lodge, Clifton
J. T.. . .	Havyet Lodge, Langford, R.S.O., Somerset	Edwards, C. L. F. .	The Court, Axbridge, Somerset
se, H., M.P.	Hadspen House, Castle Cary	Farwell, F. G.. .	11, Laura Place, Bath
lyn, E. H.,	Langford Court, Langford, Somerset	Fowler, W. H.. .	Claremont, Taunton
M. St. J. .	Chapel House, Bath	Gibbons, G. . . .	Tunley Farm, near Bath
Sir A. W., ...	Grittleton, Chippenham	Hall, J. F. . . .	Sharcombe, Wells, Somerset
H. B. . .	Chippenham	Heytesbury, Lord .	Heytesbury, Wilts
n, Major C.D.	Evercreech, Bath	Hood, Sir A. Acland, Bart., M.P.	St. Audries, Bridgwater
Col. H. M..	Warleigh Manor, Bath	Skinner, A. C. .	Pound, Bishop's Lydeard, Somerset
s, E. W.. .	Herringston, Dorchester	Strachey, E., M.P. .	Pensford, Somerset

THERN DIVISION (Hants, Berks, Oxon, Bucks, Middlesex, Surrey, Sussex, and Kent).

(12 *Representatives.*)

A. F. M. . .	Bladon, Woodstock	Ashcroft, W. . .	13, The Waldrons, Croydon
, C. R. . .	Grange Cottage, Alresford, Hants	Botkler, Capt. W. J. C.	The Elms, Taplow
d, A. . .	Eatons, Steyning	Cundall, H. M., F.S.A.	Richmond, Surrey
F. . . .	44, Great Ormond Street, Bloomsbury, London	Jones, H. P. . . .	Beaufort House, Winchester
ead, C., F.L.S.	Barming House, Maidstone	Pain, C.	Grosvenor House, Stockbridge, Hants
s, A. G. . .	Portsea, Hants	Sutton, M. J. . .	Wargrave Manor, Twyford, R.S.O., Berks

I-WESTERN DIVISION (Worcestershire, Gloucestershire, Herefordshire, Monmouthshire, and Wales).

(10 *Representatives.*)

ght, J. H. .	Hampton Court, Leominster	Baker, G. E. Lloyd	Hardwicke Court, Gloucester
, G. E. . .	Ham Court, Upton-on-Severn	Best, Capt. J. C.. .	Vivod, Llangollen
A.. . . .	North Hill, Swansea	Buck, A.	Worcester
s, C. D. . .	Newport, Mon.	Taylor, H. W. . .	Showle Court, Ledbury
n, R. . . .	The Duffryn, Newport, Mon.	Turner, A. P. . .	The Leen, Pembridge, Hereford

WITHOUT REFERENCE TO DISTRICT DIVISION.

(*8 *Representatives.*)

apt. T. G. .	Dean House, Whitchurch, Hants	Cobb, H. M. . . .	Higham, Kent
, C. . . .	Wiston Park, Steyning	Naper, Col. W. D. .	84, Cornwall Gardens, London, S.W.
, T. . . .	Dorchester, Oxon	Ryland, Howard P.	Moxhull Park, Erdington, Warwick
		Seymour, R. A. H. .	46, Earl Street, Maidstone

There is at the present time one vacancy in the Without Reference to District Division

STANDING COMMITTEES, 1897-98.

[The President is *ex-officio* Member of all Committees.]

AGRICULTURAL EDUCATION.

Paget, Right Hon. Sir R. H., Bart., *Chairman.*

Acland, Rt. Hon. Sir T. D., Bart.
Acland, C. T. D.
Allen, J. D.
Best, Col. G.
Bolitho, T. B. (M.P.)
Edwards, C. L. F.
Gibbons, G.
Goring, Rev. J.
Hobhouse, H. (M.P.)
Knollys, C. R.
Latham, T.
Lennard, Sir J. F., Bart.
Llewellyn, E. H. (M.P.)
Maskelyne, N. Story-
Sutton, M. J.

(With power to add to their number.)

ALLOTMENT.

Best, Capt. J. C., *Chairman.*

Best, Col.
Boteler, Capt. W. J. C.
Edwards, C. L. F.
Gibbons, G.
Napier, H. B.
Sillifant, A. O.

ARTS.

Acland, Right Hon. Sir T. D., Bart., *Chairman.*
Wyatt-Edgell, Col. A., *Vice-Chairman.*

Acland, C. T. D.
Bath, Marquess of
Cundall, H. M. (F.S.A.)
Daw, R. R. M.
Farwell, F. G.
Hall, J. F.
Moore-Stevens, J. C.
Morrell, G. H. (M.P.)
Naper, Col. W. D.
Williams, E. W.

(With power to add to their number.)

CONTRACTS.

Llewellyn, E. H. (M.P.), *Chairman.*

Best, Capt. J. C.
Boteler, Capt. W. J. C.
Edwards, C. L. F.
Mason, A.
Napier, H. B.
Neville-Grenville, R.

DAIRY.

Acland, C. T. D., *Chairman.*

Acland, Rt. Hon. Sir T. D., Bart.
Allen, J. D.
Ashcroft, W.
Edwards, C. L. F.
Fowler, W. H.
Gibbons, G.
Hall, J. F.
Knollys, C. R.
Latham, T.
Lennard, Sir J. F., Bart.
Llewellyn, E. H. (M.P.)
Maskelyne, N. Story-
Napier, H. B.
Neville-Grenville, R.
Paget, Rt. Hon. Sir R. H., Bart.
Wippell, R.

DISQUALIFYING.

The Stewards of Horses.
The Stewards of Stock.
The Steward of Poultry.

EXPERIMENTS.

Acland, Right Hon. Sir T. D., Bart., *Chairman.*

Acland, C. T. D.
Allen, J. D.
Ashcroft, W.
Dyke, T.
Druce, A. F. M.
Farwell, F. G.
Gibbons, G.
Gibson, J. T.
Heytesbury, Lord
Knollys, C. R.
Lennard, Sir J. F., Bart.
Llewellyn, E. H. (M.P.)
Maskelyne, N. Story-
Neville-Grenville, R.
Paget, Rt. Hon. Sir R. H., Bart.
Sutton, M. J

(With power to add to their number.)

FINANCE.

Collins, C. R., *Chairman.*

Dyke, T.

Martin, G. E.

IMPLEMENT REGULATIONS.

Shelley, Sir J., *Chairman.*

C. T. D.
pt. J. C.
, Capt. W. J. C.

Edwards, C. L. F.
Gibbons, G.
Heytesbury, Lord
Llewellyn, E. H. (M.P.)

Mason, A.
Napier, H. B.
Neville-Grenville, R.

JOURNAL.

Acland, Right Hon. Sir T. D., Bart., *Chairman.*

C. T. D.

Dymond, F. W.
Maskelyne, N. Story-

Martin, G. E.

JUDGES' SELECTION.

Lennard, Sir J. F., Bart., *Chairman.*

J. D.
ol. G.
W. J.
A. F. M.

Gibbons, G.
Hall, J. F.
Moore-Stevens, J. C.

Shelley, Sir J., Bart.
Sillifant, A. O.
Williams, E. W.

RAILWAY ARRANGEMENTS AND ADVERTISEMENTS.

Best, Capt. J. C., *Chairman.*

t, Earl
arl of
ry, Earl of
A. F. M.

Ilchester Earl of
Lennard, Sir J. F., Bart.
Lopes, Sir M., Bart.

Mason, A.
Morley, Earl of
Shelley, Sir J., Bart.

(With power to add to their number.)

SELECTION.

The Chairmen of all other Committees.

SHOW DATES.

airmen of the Allotment, Dairy, Finance, Implement Regulations, ilway Arrangements, and Stock Prize-Sheet Committees, and The ward of Works.

(With power to add two to their number.)

STOCK PRIZE-SHEET.

Lennard, Sir J. F., Bart., *Chairman.*

J. D.
arquess of
ol. G.
W. J.
, T.
A. F. M.

Gibbons, G.
Heytesbury, Lord
Llewellyn, E. H. (M.P.)
Marker, R.
Moore-Stevens, J. C.

Sanders, E. J.
Shelley, Sir J., Bart.
Sillifant, A. O.
Stanford, A.
Williams, E. W.

Stewards.

Arts.

Cundall, H. M. (F.S.A.)
Farwell, F. G.

Bees.

Farwell, F. G.

Butter Test.

Llewellyn, E. H. (M.P.)

Cattle, Sheep and Pigs.

Druce, A. F. M.
Lennard, Sir J. F., Bart.
Sillifant, A. O.

Cider.

Farwell, F. G.

Dairy.

Gibbons, G.
Knollys, C. R.

Assistant Dairy Steward (Milking).

Latham, T.

Dairy Schools.

Gibbons, G.

Experiments.

Knollys, C. R.
Ashcroft, W.
Druce, A. F. M.

Farriery School.

Best, Col. G.

Finance.

Collins, C. R.
Martin, G. E.
Dyke, T.

Horses.

Williams, E. W.
Best, Col. G.

Horticulture.

Fowler, W. H.

Music.

Cundall, H. M. (F.S.A.)

Poultry.

Sanders, E. J.

Shoeing.

Latham, T.

Works.

Napier, H. B.

Yard.

Best, Capt. J. C.
Edwards, C. L. F.
Boteler, Capt. W. J. C.

Assistant Yard Steward.

Mason, A.

Other Honorary Officials.

Treasurer—Badcock, H. J.
Local Treasurer—Dymond, F. W.
Consulting Surveyor—Spackman, H.

Permanent Staff.

Secretary—Plowman, Thomas F.

Editor of 'Journal.'

Plowman, Thos. F.

Associate Editor.

Lloyd, F. J. (F.I.C.)

Auditor.

Goodman, A. (*Chartered Accountant*)

Consulting Chemist.

Voelcker, Dr. J. A. (M.A., F.I.C.)

Consulting Botanist.

Carruthers, W. (F.R.S.)

Veterinary Inspector.

Brown, Sir G. T. (C.B.)

Superintendent of Works.

Rossiter, J.

Members' Privileges.

EXAMINATION OF PLANTS AND SEEDS.

**of the Bath and West and Southern Counties Society, who may also
embers of other Agricultural Societies, are particularly requested, in
ing for Examination of Plants and Seeds, to state that they do so as
bers of the first-named Society.**

ncil have arranged for the following rates of charge for the exami-
' the Society's Consulting Botanist, of Plants and Seeds for the *bonâ fide*
ridual information and benefit of Members of the Society (not being
). The charge for examination must be paid at the time of application,
arriago of all parcels must be prepaid.

ort on the purity and germinating power of a sample of seed, stating the sorts mount of any other seeds found therein	1*s.*
mination of the species of any weed or other plant, or of any epiphyte or vegetable site, with a report on its habits, and the means for its extermination or prevention	1*s.*
rt on any disease affecting farm crops	1*s.*
mination of the species of a collection of natural grasses found in any district, a report on their habits and pasture value	5*s.*

*e Consulting Botanist's Reports on Seeds are furnished to enable Members,—pur-
eeds and corn for Agricultural or Horticultural purposes,—to test the value of what
nd not to be used or made available for advertising or trade purposes.*

PURCHASE OF SEEDS.

urchaser should obtain from the vendor, by invoice or otherwise, a
signation of the seed he buys, with a guarantee that it contains not
n a specified amount of other seeds, and is free from ergot, or, in the
overs, from dodder, and of the percentage of seeds that will germinate.

rmination of cereals, green crops, clover, and timothy grass should be
an 90 per cent.; of fox-tail not less than 60 per cent.; of other grasses
an 70 per cent.

uncil strongly recommend that the purchase of prepared mixtures should
d, and that the different seeds to be sown should be purchased separately.

RUCTIONS FOR SELECTING AND SENDING SAMPLES.

I. Seeds.

ling seed or corn for examination the utmost care must be taken to
air and honest sample. In the case of grass-seeds the sample should
from the centre of the sack or bag, and in all cases from the bulk
to the purchaser and not from the purchase sample. When bought by
he whole or part of that sample should also be sent.

it is considered necessary to secure legal evidence, the sample should be
m the bulk and placed in a sealed bag in the presence of a reliable
ho is acquainted with the identity of the bulk, and care should be
t the purchased sample and bulk be not tampered with after delivery,
or come in contact with any other sample or stock.

nce of grass and other small seeds should be sent, and two ounces
or larger seeds. The exact name under which the seed has been
ould be sent with it.

eeds should be sent at least FOUR WEEKS, *and clover-seeds* TWO WEEKS
y are required, and they should not be sown until the report has been

II. Plants.

cting specimens of plants, the whole plant should be taken up, and the
ken from the roots. If possible, the plants must be in flower or fruit.
uld be packed in a light box, or in a firm paper parcel.

ens of diseased plants or of parasites should be forwarded as fresh as
They should be placed in a bottle, or packed in tinfoil or oil-silk.

cimens should be accompanied with a letter specifying the nature of
nation required, and stating any local circumstances (soil, situation, &c.)
the opinion of the sender, would be likely to throw light on the inquiry.

or letters containing seeds or plants for examination (carriage or
repaid) must be addressed to Mr. W. Carruthers, F.R.S., 43, Central
wood, London, S.E.

Members' Privileges.

ANALYSES OF FERTILISERS, FEEDING-STUFFS, WATERS, SOILS, &c.

Applicable only to the case of Persons who are not commercially engaged in t manufacture or sale of any substance sent for Analysis.)

Members of the Bath and West and Southern Counties Society, who may al be Members of other Agricultural Societies, are particularly requested, applying for Analyses, to state that they do so as Members of the fir named Society.

The Council have fixed the following rates of Charges for Chemical Analysis to Members of t Society.

These privileges are applicable only when the Analyses are for *bonâ-fide* agricultural p poses, and are required by Members of the Society for their own use and guidance in respect farms or land in their own occupation and within the United Kingdom.

The analyses are given on the understanding that they are required for the individual a sole benefit of the Member applying for them, and must not be used for other persons, or commercial purposes.

Land or estate agents, bailiffs, and others, when forwarding samples, are required to st the names of those Members on whose behalf they apply.

Members are also allowed to send for analysis under these privileges any manures or feedi stuffs to be used by their outgoing tenants, or which are to be given free of cost to their occupyi tenants.

The analyses and reports may not be communicated to either vendor or manufacturer, exc in cases of dispute.

Members are requested, when applying for an analysis, to quote the number in the subjoi schedule under which they wish it to be made.

No.
1.—An opinion of the purity of bone-dust or oil-cake (each sample) . . . . . 2s.
2.—An analysis of sulphate or muriate of ammonia, or of nitrate of soda, together with an opinion as to whether it be worth the price charged . . . . . .
3.—An analysis of guano; showing the proportion of moisture, organic matter, sand, phosphate of lime, alkaline salts and ammonia, together with an opinion as to whether it be worth the price charged 1
4.—An analysis of mineral superphosphate of lime for soluble phosphates only, together with an opinion as to whether it be worth the price charged . . . .
5.—An analysis of superphosphate of lime, dissolved bones, &c., showing the proportions of moisture, organic matter, sand, soluble and insoluble phosphates, sulphate of lime, and ammonia, together with an opinion as to whether it be worth the price charged 1
6.—An analysis of bone-dust, basic slag, or any other ordinary artificial manure, together with an opinion as to whether it be worth the price charged 1
7.—An analysis of compound artificial manures, animal products, refuse substances used for manure, &c. . . . . from 10s. to
8.—An analysis of limestone, showing the proportion of lime . . . . . . 7s.
9.—An analysis of limestone, showing the proportion of lime and magnesia 1
10.—An analysis of limestone or marls, showing the proportion of carbonate, phosphate, and sulphate of lime and magnesia, with sand and clay 1
11.—Partial analysis of a soil, including determinations of clay, sand, organic matter, and carbonate of lime 1
2.—Complete analysis of a soil . . . .
n analysis of oil-cake or other substance used for feeding purposes, showing the proportion of moisture, oil, mineral matter, albuminous matter, and woody fibre, as well as of starch, gum, and sugar in the aggregate; and an opinion of its eeding and fattening or milk-producing properties 1
Analysis of any vegetable product 1
.—Determination of the "hardness" of a sample of water before and after boiling . .
6.—Analysis of water of land-drainage, and of water used for irrigation . . . . .
7.—Analysis of water used for domestic purposes £1 1
n analysis of milk (to assist Members in the management of their Dairies and Herds, *bonâ fide* for their own information and not for trade purposes, nor for use n connection with the Sale of Food and Drugs Acts) . . . .
rsonal consultation with the Consulting Chemist. (To prevent disappointment t is suggested that Members desiring to hold a consultation with the Consulting Chemist should write to make an appointment) . . . .
onsultation by letter . . . .
—Consultation necessitating the writing of three or more letters . . . . . .

embers wishing to exercise their privileges on the above-named terms, should forward t ples for examination, *by post or parcel, prepaid*, to the Consulting Chemist, Dr. JO UGUSTUS VOELCKER, M.A., F.I.C., 22, Tudor Street, New Bridge Street, London, E.C. [illegible] must be sent to the Consulting Chemist at the time of application.

GUIDE TO PURCHASERS OF FERTILISERS AND FEEDING-STUFFS.

ER the provisions of the Fertilisers and Feeding Stuffs Act of 1893, District icultural Analysts have been appointed throughout the country to examine ples taken in compliance with the Act. Inasmuch, however, as the procedure ssitated in these cases is very complicated, Members of the Bath and West Southern Counties Society will find it much simpler to avail themselves of privileges afforded by the Society, and will be able to protect themselves, amply and with far less trouble, by making their purchases in accordance h the following directions, and by stipulating that purchases shall be **subject he analysis and report of the Society's Consulting Chemist.**

---

urchasers are recommended in every case to insist upon having an *Invoice* en to them. This invoice should set out clearly:—

n the case of **Fertilisers**—

(1.) the **name** of the fertiliser;
(2.) whether the fertiliser be artificially **compounded** or not;
(3.) the minimum **analysis** guaranteed in respect of the principal fertilising ingredients.

n the case of **Feeding-Stuffs**—

(1.) the **name** of the article;
(2.) the **description** of the article: whether it has been made from one substance or seed only, or from more than one.

NOTE.—The use of the terms "Linseed-cake," "Cotton-cake," &c., implies that these cakes shall be "pure," and purchasers are recommended to insist upon these terms being used without any qualification such as "95 per cent.," "as imported," &c. "Oil-cake" should be avoided. Mixed feeding-cakes and meals should be only purchased with a guaranteed analysis.)

Iembers of the Society should see that the **Invoices** agree accurately with orders given by them, and, in giving these orders, they should stipulate that goods come up to the guarantees set out in the following list, and that they old **subject to the analysis and report of the Consulting Chemist of the Bath West and Southern Counties Society.**

FERTILISERS.

aw Bones, Bone-meal, or **Bone-dust** to be guaranteed "PURE," and to contain less than 45 per cent. of Phosphate of Lime, and not less than 4 per cent. of monia.

oiled Bones to be guaranteed "PURE," and to contain not less than 55 per t. of Phosphate of Lime, and not less than 1 per cent. of Ammonia.

Iineral Superphosphate of Lime to be guaranteed to contain a certain entage of "Soluble Phosphate." [From 25 to 28 per cent. of Soluble sphate is an ordinarily good quality.]

issolved Bones to be guaranteed to be "made from raw bone and acid only," to be sold as containing stated minimum percentages of Soluble Phosphate, luble Phosphates, and Ammonia.

ompound Artificial Manures, Bone Manures, Bone Compounds, &c., to be sold nalysis stating the minimum percentages of Soluble Phosphate, Insoluble sphates, and Ammonia contained.

asic Slag to be guaranteed to contain a certain percentage of Phosphoric d [a good quality contains 17 per cent. or more of Phosphoric Acid], and to sufficiently finely ground that 80 to 90 per cent. passes through a sieve ing 10,000 meshes to the square inch.

eruvian Guano to be described by that name, and to be sold by **analysis** ing the minimum percentages of Phosphates and Ammonia.

Sulphate of Ammonia to be guaranteed to be "PURE," and to contain not less than 24 per cent. of Ammonia.

Nitrate of Soda to be guaranteed to contain 95 per cent. of pure Nitrate of Soda.

Kainit to be guaranteed to contain 23 per cent. of Sulphate of Potash.

All Fertilisers to be delivered in good and suitable condition for sowing.

FEEDING-STUFFS.

Linseed Cake, Cotton Cake (Decorticated and Undecorticated), and **Rape Cake** (for feeding purposes) to be pure, *i.e.* prepared *only* from the one kind of seed from which their name is derived. The report of the Consulting Chemist of the Bath and West and Southern Counties Society to be conclusive as to the "purity" or otherwise of any feeding-stuffs.

Mixed Feeding Cakes, Meals, &c., to be sold on a guaranteed analysis.

INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES FOR ANALYSIS.

GENERAL RULES.

1.—A sample taken for analysis should be fairly *representative of the bulk* from which it has been drawn.

2.—The sample should reach the Analyst *in the same condition* as it was at the time when drawn.

FERTILISERS.

When **Fertilisers** are delivered in bags, select four or five of these from the bulk, and either turn them out on a floor and rapidly mix their contents, or else drive a shovel into each bag and draw out from as near the centre as possible a couple of shovelfuls of the manure, and mix these quickly on a floor.

Halve the heap obtained in either of these ways, take one-half (rejecting the other) and mix again rapidly, flattening down with the shovel any lumps that appear. Repeat this operation until at last only some three or four pounds are left.

From this fill three tins, holding from ½-lb. to 1-lb. each, mark, fasten up and seal each of these. Send one for analysis, and retain the others for reference.

Or,—the manure may be put into glass bottles provided with well-fitting corks; the bottles should be labelled and the corks sealed down. The sample sent for analysis can be packed in a wooden box and sent by post or rail.

When manures are delivered in bulk, portions should be successively drawn from *different parts* of the bulk, the heap being turned over now and again. The portions drawn should be thoroughly mixed, sub-divided, and, finally, samples should be taken as before, except that when the manure is coarse and bulky it is advisable to send larger samples than when it is in a finely-divided condition.

FEEDING-STUFFS.

Linseed, Cotton, and other Feeding Cakes.—If a single cake be taken, three strips should be broken off right across the cake and from the middle portion of it, one piece to be sent for analysis, and the other two retained for reference. Each of the three pieces should be marked, wrapped in paper, fastened up and sealed. The piece forwarded for analysis can be sent by post or rail.

A more satisfactory plan is to select four to six cakes from different parts of the delivery, then break off a piece about four inches wide from the middle of h cake, and pass these pieces through a cake-breaker. The broken cake uld then be well mixed, and three samples of about 1 lb. each should be en and put in tins or bags duly marked, fastened, and sealed as before. One these lots should be sent for analysis, the remaining two being kept for erence. It is advisable, also, with the broken pieces to send a small strip m an unbroken cake.

Feeding Meals, Grain, &c.—Handfuls should be drawn from the centre of lf-a-dozen different bags of the delivery; these lots should then be well xed, and three ½-lb. tins or bags filled from the heap, each being marked, tened up, and sealed. One sample is to be forwarded for analysis and the ers retained for reference.

SOILS, WATERS, &c.

Soils.—Have a wooden box made 6 inches in length and width, and from to 12 inches deep, according to the depth of soil and subsoil of the field. ark out in the field a space of about 12 inches square; dig round in a slanting rection a trench, so as to leave undisturbed a block of soil and its subsoil to 12 inches deep; trim this block to make it fit into the wooden box, invert e open box over it, press down firmly, then pass a spade under the box and lift up, gently turn over the box, nail on the lid, and send by rail. The soil will en be received in the position in which it is found in the field.

In the case of very light, sandy, and porous soils, the wooden box may be at ce inverted over the soil and forced down by pressure, and then dug out.

Waters.—Samples of water are best sent in glass-stoppered Winchester ttles, holding half-a-gallon. One such bottle is sufficient for a single sample. re should be taken to have these scrupulously clean. In taking a sample of ater for analysis it is advisable to reject the first portion drawn or pumped, so to obtain a sample of the water when in ordinary flow. The bottle should be nsed out with the water that is to be analysed, and it should be filled nearly to e top. The stopper should be secured with string, or be tied over with linen soft leather. The sample can then be sent carefully packed either in a ooden box with sawdust, &c., or in a hamper with straw.

Milk.—A pint bottle should be sent in a wooden box.

GENERAL INSTRUCTIONS.

Time for Taking Samples.—All samples, both of fertilisers and feeding-stuffs, ould be taken as soon after their delivery as possible, and should reach the nalyst within *ten days* after delivery of the article. In every case it is advis- le that the Analyst's certificate be received before a fertiliser is sown or a eding-stuff is given to stock.

Procedure in the Event of the Vendor wishing Fresh Samples to be Drawn.— hould a purchaser find that the Analyst's certificate shows a fertiliser or eding-stuff not to come up to the guarantee given him, he may inform the endor of the result and complain accordingly. He should then send to the endor *one* of the two samples which he has kept for reference. If, however, the endor should demand that a fresh sample be drawn, the purchaser must allow is, and also give the vendor an opportunity of being present, either in person r through a representative whom he may appoint. In that case, three samples ould be taken in the presence of both parties with the same precautions as efore described, *each* of which should be duly packed up, labelled, and *sealed* by oth parties. One of these is to be given to the vendor, one is to be sent to the nalyst, and the third is to be kept by the purchaser for reference or future nalysis if necessary.

All samples intended for the Consulting Chemist of the Society should be ddressed (postage or carriage prepaid) to Dr. J. AUGUSTUS VOELCKER, M.A., I.C., 22, Tudor Street, New Bridge Street, London, E.C. Separate letters of nstruction should be sent at the same time.

CARDIFF MEETING,

May 25, 26, 27, 28, and 30, 1898.

MONEY PRIZES.

	£	s.	d.		PAGE
Horses	780	0	0	..	lxxxi
Cattle	1,278	10	0	..	lxxxiv
Sheep	415	0	0	..	lxxxvii
Pigs	200	0	0	..	lxxxviii
Cheese	116	0	0	..	xci
Butter and Cream	59	10	0	..	xci
Butter-Making	40	0	0	..	xcii
Milking	11	5	0	..	xciii
Shoeing	22	0	0	..	xciii
Poultry	170	11	0	..	cii
Total	£3,092	16	0		

DONORS OF MONEY PRIZES.

	£	s.	d.
Bath and West and Southern Counties Society	2,829	5	0
Cardiff Local Committee	200	0	0
English Jersey Cattle Society	30	0	0
Kerry and Dexter Cattle Society	10	10	0
Captain J. C. Best, R.N.	10	0	0
Shorthorn Dairy Prize Fund Committee	10	0	0
English Guernsey Cattle Society	2	0	0
Mr. A. E. Morgan	1	1	0
	£3,092	16	0

DONORS OF MEDALS AND PLATE.

In addition to the Money Prizes, there are offered:—

A Gold Medal, in the Shire Horse Classes, by the Shire Horse Society.

A Gold and a Silver Medal, in the Hunter Classes, by the Hunters' Improvement Society.

A Challenge Silver Bowl, in the Jersey Classes, by Sir James Blyth, Bart.

A Challenge Cup, value 25 Guineas, in the Jersey Classes, by the Duke of Marlborough.

A Gold, a Silver, and a Bronze Medal, in the Butter Test Classes, by the English Jersey Cattle Society.

A Silver Cup, and a Silver, and a Bronze Medal, in the Guernsey Butter Test Class, by the English Guernsey Cattle Society.

A Gold Medal, and 24 Silver, and 24 Bronze Medals, in the Cider Classes, by the Society.

A Gold, a Silver, and a Bronze Medal, in the Butter-making Classes, by the Society.

A Silver Cup, in the Poultry Classes, by Sir Walter Gilbey, Bart.

A Silver Cup, in the Poultry Classes, by Mr. W. B. Tegetmeier.

PRIZES.

HORSES.	First Prize.	Second Prize.	Third Prize.
mals entered in the Open Classes can, if elegible, be so entered, on payment of an additional fee, in the ocal Classes, Nos. 10, 11, 12, 13, 16, 23, 28, 30, 38, ıd 41. (See Note at foot of page.)	£	£	£
SHIRE.			
ligible for the Shire Horse Society's Stud Book.)			
ss			
.—STALLION, foaled before 1896	20	10	5
.—STALLION, foaled in 1896	20	10	5
.—COLT, foaled in 1897	15	10	5
.—MARE and FOAL, or in-FOAL	20	10	5
.—FILLY, foaled in 1895	10	5	2
.—FILLY, foaled in 1896	10	5	2
.—FILLY, foaled in 1897	10	5	2
Offered by the Shire Horse Society, a Gold Medal, value £10, for Best MARE or FILLY in Class 4, 5, 6, or 7, under Conditions 46, stated on page xcviii.			
NY AGRICULTURAL BREED EXCEPT SHIRE.			
.—FILLY or GELDING, foaled in 1895 . . .	10	5	2
.—FILLY or GELDING, foaled in 1896 . . .	10	5	2
ANY AGRICULTURAL BREED.			
. *Stallion, that shall have travelled Glamorganshire during the year 1898 . . .*	*10*	*5*	
. *Mare and Foal, or in-Foal, to foal before July 1st*	*8*	*4*	
.-*Filly or Gelding, foaled in 1896 . . .*	*6*	*3*	
. *Filly or Colt, foaled in 1897 . . . .*	*6*	*3*	
COLLIERY HORSES.			
.—MARE and FOAL, or in-FOAL, not exceeding 13.2 hands, adapted for Colliery purposes, but which has not yet been worked underground	10	5	2
.—MARE or GELDING, not exceeding 15.2 hands, adapted for Colliery purposes, but which has not yet been worked underground . .	10	5	2
. *Mare or Gelding, not exceeding 15 hands, adapted for Colliery purposes, but which has not yet been worked underground . . . .*	*8*	*4*	

The Prizes in the Horse Classes printed in *italics* are offered by the Cardiff al Committee, and in Classes 11, 12, 13 and 16, competition is confined to ant Farmers residing in Glamorganshire or Monmouthshire.

HORSES—*continued.*	First Prize.	Second Prize.	Third Prize.
CLASS **HUNTERS.**	£	£	£
17.—MARE and FOAL, or in-FOAL	20	10	5
18.—MARE or GELDING, foaled in 1894	20	10	5
19.—FILLY or GELDING, foaled in 1895	15	10	5
20.—FILLY or GELDING, foaled in 1896	10	7	3
21.—FILLY, COLT, or GELDING, foaled in 1897	10	7	3
SPECIAL PRIZES.			
(Offered by the Hunters' Improvement Society.)			
A Gold Medal, or £5 and a Bronze Medal, for the best HUNTER BROOD MARE in Class 17, in-Foal to, or with Foal at-foot by, a Thoroughbred Horse or Registered Hunter Sire, under Conditions 47, stated on page xcviii.			
A Silver Medal, for the Best HUNTER FILLY in Class 19, 20, or 21, not exceeding three years' old (foaled in 1895, 1896, or 1897), under Conditions 48, stated on page xcix.			
HACKNEYS.			
22.—MARE and FOAL, or in-FOAL	15	10	5
*23.—*Mare or Gelding, not exceeding 15 hands, and not under five years old, the property of a resident in South Wales or Monmouthshire*	*8*	*4*	
24.—MARE or GELDING, foaled before 1894	10	5	2
25.—MARE or GELDING, foaled in 1894 or 1895	10	5	2
26.—FILLY or GELDING, foaled in 1896	10	5	2
27.—FILLY, COLT, or GELDING, foaled in 1897	10	5	2
PONIES.			
*28.—*Welsh Mountain Mare and Foal, not exceeding 13.1 hands, the property of a resident in South Wales or Monmouthshire*	*5*	*3*	
29.—MARE or GELDING, 4 years old or over, exceeding 13 and not exceeding 14 hands	10	5	2
*30.—*Mare or Gelding, not exceeding 14 hands, the property of a resident in South Wales or Monmouthshire*	*8*	*4*	
31.—MARE or GELDING, 4 years old or over, not exceeding 13 hands	10	5	2
HARNESS.			
Horses entered in the Hackney or Pony Classes can, if eligible, be also entered, on payment of an additional fee, in the Harness Classes.			
Horses entered in the Double Harness and Tandem Classes can also be entered, on payment of an additional fee, in the Single Harness Classes.			
32.—PAIR of CARRIAGE HORSES (Mares or Geldings), 15 hands or over, to be driven in double harness on the 2nd day of Show	15	5	2

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* The Prizes in the Horse Classes printed in *italics* are offered by the Cardiff Local Committee.

HORSES—*continued.*

s	First Prize.	Second Prize.	Third Prize.
	£	£	£
–Mare or Gelding, 15 hands or over, to be driven in single harness on the 2nd day of Show	8	4	2
–Pair of Horses (Mares or Geldings), under 15 hands, to be driven in double harness on the 3rd day of Show	15	5	2
-Mare or Gelding, over 14 and under 15 hands, to be driven in harness on the 3rd day of Show.	8	4	2
-Tandems (Mares or Geldings), 15 hands or over, to be driven in harness on the 4th day of Show	15	5	2
-Tandems (Mares or Geldings), under 15 hands, to be driven in harness on the 4th day of Show.	15	5	2
-*Dray or Cart Mare or Gelding, suitable for and having been worked by a Cardiff Brewer, Builder, Timber Merchant, Tradesman or Haulier, or the Corporation, for a period of not less than six months prior to the date of the Show; to be exhibited with gear on the 4th day of Show . . . . . .*	*6*	*3*	
-Mare or Gelding, over 13 and not over 14 hands, to be driven in harness on the 5th day of Show	10	5	2
-Mare or Gelding, not over 13 hands, to be driven in harness on the 5th day of Show .	8	4	2
-*Light Mare or Gelding, the property of a Cardiff Tradesman, used solely by him and driven regularly by his servants for the delivery of his goods, and having been in his possession for a period of not less than six months prior to the date of the Show; to be exhibited in trade cart and harness on the 5th day of Show . . . . . .*	*6*	*3*	

es entered in the Harness Classes only must be in the Show rd by 2 p.m. on the day on which they compete, and, with e consent of the Stewards, may leave the Yard as soon as the ass has been judged.

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e Prizes in the Horse Classes printed in *italics* are offered by the Cardiff ommittee.

CATTLE.

Animals entered in the Open Classes can, if eligible, be also entered, on payment of an additional fee, in the Local Classes, Nos. 53, 58, 63, and 67. (See Note at foot of page.)

DEVON.

Class	First Prize. £ s.
42.—Bull, calved in 1894 or 1895	15
43.—Bull, calved in 1896	15
44.—Bull, calved in 1897	10
45.—Cow, in-Milk or in-Calf, calved before 1895	15
46.—Heifer, in-Milk or in-Calf, calved in 1895	10
47.—Heifer, calved in 1896	10
48.—Heifer, calved in 1897	7

SHORT-HORN.

Class	First Prize. £ s.
49.—Bull, calved in 1894 or 1895	15
50.—Bull, calved in 1896	15
51.—Bull, calved in 1897	10
52.—Cow, in-Milk or in-Calf, calved before 1895	15
*53.—*Pair of Cows, in-Milk or in-Calf, calved before 1895*	*8*
54.—Heifer, in-Milk or in-Calf, calved in 1895	10

(An Animal entered in Class 52, 53, or 54, can, if eligible, be also entered, on payment of an additional fee, in Class 55.)

The First Prize in Class 55 is offered by the Short-Horn Dairy Prize Fund Committee.

Class	First Prize. £ s.
55. Pure Short-Horn Cow or Heifer, in-Milk, eligible for Coate's Herd Book, subject to the Special Conditions 58 on page xcix.	10
56.—Heifer, calved in 1896	10
57.—Heifer, calved in 1897	7
*58.—*Heifer under 3 years old*	*5*

HEREFORD.

Class	First Prize. £ s.
9.—Bull, calved in 1894 or 1895	15
0.—Bull, calved in 1896	15
1.—Bull, calved in 1897	10
2.—Cow, in-Milk or in-Calf, calved before 1895	15
Pair of Cows, in-Milk or in-Calf, calved before 895	*8*
Heifer, in-Milk or in-Calf, calved in 1895	10
5.—Heifer, calved in 1896	10
Heifer, calved in 1897	7
Heifer under 3 years old	*5*

he Prizes in the Cattle Classes printed in *italics* are offered al Committee, and competition in them is confined to resi ales or Monmouthshire.

CATTLE—*continued.*	First Prize.	Second Prize.	Third Prize.
ss **SUSSEX.**	£	£	£
.—Bull, calved in 1894 or 1895	15	10	5
.—Bull, calved in 1896 or 1897	15	10	5
.—Cow or Heifer, in-Milk or in-Calf, calved before 1896	15	10	5
.—Heifer, calved in 1896	10	5	2
.—Heifer, calved in 1897	7	5	2
ABERDEEN-ANGUS.			
.—Bull, calved in 1895, 1896, or 1897	7	5	2
.—Cow or Heifer, in-Milk or in-Calf, calved before 1896	7	5	2
.—Heifer, calved in 1896 or 1897	7	5	2
BLACK WELSH.			
.—Bull, calved in 1894 or 1895	10	5	2
.—Bull, calved in 1896	10	5	2
.—Bull, calved in 1897	7	5	2
.—Cow, in-Milk or in-Calf, calved before 1895	10	5	2
.—Heifer, in-Milk or in-Calf, calved in 1895	10	5	2
.—Heifer, calved in 1896	7	5	2
.—Heifer, calved in 1897	7	5	2
JERSEY.			
.—Bull, calved in 1894 or 1895	15	10	5
.—Bull, calved in 1896	15	10	5
.—Bull, calved in 1897	10	5	2
.—Cow, in-Milk or in-Calf, calved before 1895	15	10	5
.—Heifer, in-Milk or in-Calf, calved in 1895	10	5	2
.—Heifer, calved in 1896	10	5	2
.—Heifer, calved in 1897	7	5	2

SPECIAL PRIZES.

(Offered by Sir James Blyth, Bart.)

The Blythwood Challenge Silver Bowl, weighing 25 ounces, for the Best Cow or Heifer in-Milk, in any of the Jersey Classes, bred in Great Britain or Ireland, to be awarded by inspection (see Special Conditions 59 on page c.).

(Offered by His Grace the Duke of Marlborough.)

A Challenge Cup, value 25 guineas, for the Best Bull, not exceeding 18 months old, Cow of any age in-Milk or in-Calf, and Heifer her produce in-Milk or in-Calf, in any of the Jersey Classes, the property of one Exhibitor (see Special Conditions 60 on page c.).

CATTLE—*continued.*

Class	First Prize.	Second Prize.	Thir Prize
GUERNSEY.	£ s.	£	£
90.—Bull, calved in 1894 or 1895	15	10	5
91.—Bull, calved in 1896	15	10	5
92.—Bull, calved in 1897	10	5	2
93.—Cow, in-Milk or in-Calf, calved before 1895 .	15	10	5
94.—Heifer, in-Milk or in-Calf, calved in 1895 .	10	5	2
95.—Heifer, calved in 1896	10	5	2
96.—Heifer, calved in 1897	7	5	2
KERRY.			
97.—Bull, calved in 1895, 1896, or 1897 . .	7	5	2
98.—Cow or Heifer, in-Milk or in-Calf, calved before 1896	7	5	2
99.—Heifer, calved in 1896 or 1897 . . .	7	5	2
SPECIAL PRIZE. (Offered by the Kerry and Dexter Cattle Society.) Best Animal in Class 97, 98, or 99, whose Sire and Dam are entered in the Herd Book . . .	5 5		
DEXTER KERRY.			
100.—Bull, calved in 1895, 1896, or 1897 . .	7	5	2
101.—Cow or Heifer, in-Milk or in-Calf, calved before 1896	7	5	2
102.—Heifer, calved in 1896 or 1897 . . .	7	5	2
SPECIAL PRIZE. (Offered by the Kerry and Dexter Cattle Society.) Best Animal in Class 100, 101, or 102, whose Sire and Dam are entered in the Herd Book . .	5 5		

DAIRY.

[illegible] Breed Classes can, if eligible, be [illegible] also, o[illegible]ment of an additional fee, in either [illegible] inclusive.

[illegible] breed or cross, under [illegible] lbs. live weight, yielding the largest quantity of Milk, containing 12·25 per cent. of total solids, of which not less than 3·25 per cent. shall be fat	10	3	2
[illegible], in-Milk, of any breed or cross, 900 lbs. [illegible] weight or over ditto ditto . .	10	3	2

	First Prize.	Second Prize.	Third Prize.
CATTLE—*continued.*			
.ASS	£	£	£
05.—*Pair of Cows in full profit*	*8*	*4*	
)6.—*Cow or Heifer in full profit*	*5*	*2*	
BUTTER TEST.			
(Offered by the English Jersey Cattle Society.)			
)7.—Cow, of any breed or cross, under 900 lbs. live weight, obtaining the greatest number of points by the practical Test of the Separator and Churn, judged by the scale of points adopted by the English Jersey Cattle Society	10	3	2
'8.—Cow of any breed or cross, 900 lbs. live weight and over ditto ditto	10	3	2
Gold, Silver, and Bronze Medals are offered for the three Jersey Cows, entered or eligible for entry in the English Jersey Herd Book, obtaining the greatest number of points in the Test.			
(Offered by the English Guernsey Cattle Society.)			
Cow or Heifer, entered in the English Guernsey Cattle Society's Herd Book, yielding the largest quantity of Butter by the practical Test of the Separator and Churn:—			
1st Prize, Silver Cup, value £5.			
2nd ,, Silver Medal and	1		
3rd ,, Bronze Medal and	1		
SHEEP.			
'mals entered in the Open Classes can, if eligible, be lso entered, on payment of an additional fee, in the ocal Classes, Nos. 133, 134, and 135.			
COTSWOLD.			
.—Shearling RAM	10	5	2
.—Pair of RAM LAMBS, dropped in 1898 . .	10	5	2
.—Pen of three Shearling EWES	10	5	2
DEVON LONG-WOOL.			
—Shearling RAM	10	5	2
—Pair of RAM LAMBS, dropped in 1898 . .	10	5	2
—Pen of three Shearling EWES	10	5	2

The Prizes in the Cattle Classes printed in *italics* are offered by the Cardiff ıl Committee, and competition in them is confined to residents in South es or Monmouthshire.

SHEEP—*continued.*	First Prize.	Second Prize.	Third Prize.
CLASS **SOUTHDOWN.**	£	£	£
116—Shearling RAM	10	5	2
117.—Pair of RAM LAMBS, dropped in 1898	10	5	2
118.—Pen of three Shearling EWES	10	5	2
HAMPSHIRE DOWN.			
119.—Shearling RAM	10	5	2
120.—Pair of RAM LAMBS, dropped in 1898	10	5	2
121.—Pen of three Shearling EWES	10	5	2
SHROPSHIRE.			
122.—Shearling RAM	10	5	2
123.—Pair of RAM LAMBS, dropped in 1898	10	5	2
124.—Pen of three Shearling EWES	10	5	2
OXFORD DOWN.			
125.—Shearling RAM	10	5	2
126.—Pair of RAM LAMBS, dropped in 1898	10	5	2
127.—Pen of three Shearling EWES	10	5	2
SOMERSET AND DORSET HORN.			
128.—Shearling RAM	10	5	2
129.—Pair of RAM LAMBS, dropped after Nov. 1st, 1897	10	5	2
130.—Pen of three Shearling EWES	10	5	2
WELSH MOUNTAIN.			
131.—Two Shear or Shearling RAM	10	5	2
132.—Pen of three Shearling EWES	10	5	2
ANY BREED.			
*133.—*Pair of Ram Lambs, dropped in 1898*	*5*	*3*	
*134.—*Pen of three Ewes that have bred Lambs in 1898 (with or without offspring)*	*5*	*3*	
*135.—*Pen of three Ewe Lambs*	*5*	*3*	
PIGS.			
BERKSHIRE.			
136.—BOAR, farrowed in 1895, 1896, or 1897	7	3	2
137.—Pair of BOARS, farrowed in 1898	5	2	1
138.—Breeding Sow, farrowed before 1898	7	3	2
139.—Pair of Breeding Sows, farrowed in 1898	5	2	1

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* The Prizes in Classes 133, 134, and 135 are offered by the Cardiff Local Committee, and competition in them is confined to Tenant Farmers residing in South Wales or Monmouthshire.

PIGS—*continued.*	First Prize.	Second Prize.	Third Prize.
LARGE WHITE.	£	£	£
Boar, farrowed in 1895, 1896, or 1897 . .	7	3	2
Pair of Boars, farrowed in 1898 . . .	5	2	1
Breeding Sow, farrowed before 1898 . .	7	3	2
Pair of Breeding Sows, farrowed in 1898 . .	5	2	1
MIDDLE WHITE.			
Boar, farrowed in 1895, 1896, or 1897 . .	7	3	2
Pair of Boars, farrowed in 1898 . . .	5	2	1
Breeding Sow, farrowed before 1898 . .	7	3	2
Pair of Breeding Sows, farrowed in 1898 . .	5	2	1
SMALL WHITE or SMALL BLACK.			
Boar, farrowed in 1895, 1896, or 1897 . .	7	3	2
Pair of Boars, farrowed in 1898 . . .	5	2	1
Breeding Sow, farrowed before 1898 . .	7	3	2
Pair of Breeding Sows, farrowed in 1898 . .	5	2	1
TAMWORTH.			
Boar, farrowed in 1895, 1896, or 1897 . .	7	3	2
Pair of Boars, farrowed in 1898 . . .	5	2	1
Breeding Sow, farrowed before 1898 . .	7	3	2
Pair of Breeding Sows, farrowed in 1898 . .	5	2	1

PRODUCE.

CIDER.

(Open to Growers or Makers.)

First Prize in each Class, a Silver Medal and a Certificate.
Second Prize in each Class, a Bronze Medal and a Certificate.

CHAMPION PRIZE.

For Best Exhibit in any of the Classes, a Gold Medal and a Certificate.

The Cider must have been made in 1897, and each Exhibit in Cask must consist of not less than 18 gallons.

CLASS

Cider made in Devon.

156.—Cask of CIDER (*open to* LANDOWNERS *only*).
157.—12 Bottles of CIDER (*open to* LANDOWNERS *only*).
158.—Cask of CIDER (*open to* TENANT FARMERS *only*).
159.—12 Bottles of CIDER (*open to* TENANT FARMERS *only*).
160.—Cask of CIDER (*open to* CIDER MERCHANTS *only*).
161.—12 Bottles of CIDER (*open to* CIDER MERCHANTS *only*).

Cider made in Herefordshire.

162.—Cask of CIDER (*open to* LANDOWNERS *only*).
163.—12 Bottles of CIDER (*open to* LANDOWNERS *only*).
164.—Cask of CIDER (*open to* TENANT FARMERS *only*).
165.—12 Bottles of CIDER (*open to* TENANT FARMERS *only*).
166.—Cask of CIDER (*open to* CIDER MERCHANTS *only*).
167.—12 Bottles of CIDER (*open* to CIDER MERCHANTS *only*).

Cider made in Somerset.

168.—Cask of CIDER (*open to* LANDOWNERS *only*).
69.—12 Bottles of CIDER (*open to* LANDOWNERS *only*).
70.—Cask of CIDER (*open to* TENANT FARMERS *only*).
71.—12 Bottles of CIDER (*open to* TENANT FARMERS *only*).
2.—Cask of CIDER (*open to* CIDER MERCHANTS *only*).
[illegible]—12 Bottles of CIDER (*open to* CIDER MERCHANTS *only*).

[illegible] other than Devon, Herefordshire, or Somerset.

[illegible]—Cask of CIDER (*open to* LANDOWNERS *only*).
5.—12 Bottles of CIDER (*open to* LANDOWNERS *only*).
6.—Cask of CIDER (*open to* TENANT FARMERS *only*).
7.—12 Bottles of CIDER (*open to* TENANT FARMERS *only*).
8.—Cask of CIDER (*open to* CIDER MERCHANTS *only*).
9.—12 Bottles of CIDER (*open to* CIDER MERCHANTS *only*).

	First Prize.	Second Prize.	Third Prize.	
CHEESE.	£	£	£	
ss				
.—Three CHEESES (not less than 56 lbs. each), made in 1897 . . .	15	10	5	
.—Three Cheddar CHEESES (not less than 28 lbs. each), made in 1897 by a Student who has received not less than a week's instruction in one of the Society's Cheese Schools . .	8	5	3	
.—Three CHEESES (not less than 28 lbs. each), made in 1898 . . .	8	5	3	
.—Three Cheddar CHEESES (not less than 28 lbs. each), made in 1898 by a Student who has received not less than a week's instruction in one of the Society's Cheese Schools . .	6	4	2	
.—Eight Loaf or other Truckle CHEESES, made in 1898	5	3	2	
.—Three Caerphilly CHEESES, made in 1898	3	2	1	1
The Prizes in Class 186 are offered by the Cardiff Local Committee.				
.—*56 lbs. of Caerphilly Cheese, made in Glamorganshire or Monmouthshire*	*4*	*3*	*2*	
.—Three Cream or other Soft CHEESES .	3	2	1	1
BUTTER AND CREAM.				
These Classes are not open to Professional Teachers.)				
.—3 lbs. of Fresh (or very slightly salted) BUTTER, in pound rolls or brick-shapes, made of Cream from Cows other than Channel Island Breeds .	4	3	2	
.—3 lbs. of Fresh (or very slightly salted) BUTTER, in pound rolls or brick-shapes, made of Cream from Cows of Channel Island Breeds only .	4	3	2	
.—3 lbs. of Fresh (or very slightly salted) BUTTER, in pound rolls or brick-shapes, made from scalded Cream .	4	3	2	
.—3 lbs. of BUTTER, to which no salt whatever has been added, in pound rolls or brick-shapes . . .	4	3	2	

BUTTER AND CREAM—*continued.*

CLASS	First Prize.	Second Prize.	Third Prize.	Fourth Prize.
SPECIAL PRIZES.	£	£	£	£
Three Prizes of £1 each will be given for BUTTER, which has the best keeping qualities, exhibited in Class 188, 189, 190, or 191. 1 lb. will be taken on the first day of the Show from each Prize lot of Butter in the Classes named, and will be judged on the last day of the Show.	1 1 1			
192.—12 lbs. of Salted BUTTER, in a jar or crock, to be delivered to the Secretary four weeks before the Show .	4	3	2	1
193.—4 half-pounds of Clotted or Devonshire Cream, packed either in tins or earthen jars	3	2	1	10s.

BUTTER-MAKING.

Professional Teachers, Makers or Vendors of Churns, or persons in any way representing the interests of Makers or Vendors of Churns, are not eligible to compete in the Butter-Making Classes. This Regulation will be strictly enforced.

A previous winner of the Society's Champion Gold Medal is not eligible to compete in any of the Butter-Making Classes.

These Prizes will be awarded for the best and largest quantity of Butter made from a given quantity of Cream in the cleanest and most approved method.

CLASS	First Prize.	Second Prize.	Third Prize.	Fourth Prize.
94 O he 1st day of the Show, open to y Dairymaid (not residing with or nployed by her parents) working or wages not exceeding £20 a year .	4	3	2	1
he 2nd day of the Show, open to any u or woman who has never won irst Prize in any open Butter-king competition	4	3	2	1
ne 3rd day of the Show, open to any nan	4	3	2	1
e 4th day of the Show, open to any an or woman except the winner of he 1st Prize in Class 196 . .	4	3	2	1

UTTER-MAKING—*continued.*

Champion Prizes.

n the 5th day of the Show the Winners of Prizes in Classes 194, 195, 196, and 197 will compete for:—

- 1st Prize—A Gold Medal, and the Society's Certificate.
- 2nd Prize—A Silver Medal, and the Society's Certificate.
- 3rd Prize—A Bronze Medal, and the Society's Certificate.

MILKING.

SS

	First Prize.		Second Prize.		Third Prize.		Fourth Prize.	
	£	s.	£	s.	£	s.	£	s.
—For Men 20 years of age and over	1	10	1	0	0	15	0	10
—For Women	1	10	1	0	0	15	0	10
—For Youths under 20 years of age	1	10	1	0	0	15	0	10

SHOEING.

	First Prize.		Second Prize.		Third Prize.		Fourth Prize.	
	£	s.	£	s.	£	s.	£	s.
—Best Shoeing of a Nag Horse by a Smith on the 3rd day of the Show	5	0	3	0	2	0	1	0
—Best Shoeing of a Cart Horse by a Smith on the 4th day of the Show	5	0	3	0	2	0	1	0

he Registration Committee of the Farriers' Company will admit the Winners of First Prizes in these Competitions to the Official Register *free of charge*, on their satisfying the Judges that they have a fair knowledge of the structure of the horse's foot, and on the necessary application being made to the Company in the prescribed form.

CONDITIONS AND REGULATIONS.

GENERAL.

ENTRIES.

1. The following are the Fees payable for Entries made on or before April 4. After that date and up to April 11, Entries (except in the Harness Classes) will only be received on payment, in each case, of double the Fee named below. *Exhibitors are requested to note that no exception can be made to this.*

		Members. (see Reg. 5 below)	Non-Members.
Horses other than Harness Horses (see Reg. 2 below), including Horse Box	for each Entry	10*s.*	20*s.*
Cattle, Sheep, and Pigs	do.	5*s.*	15*s.*
Butter and Milk Test (Classes 103, 104, 107, 108, and 109)	do.	21*s.*	21*s.*
Cheese, Class 180	do.	10*s.*	20*s.*
Do. Classes 182, 184, 185, 186, and 187	do.	5*s.*	10*s.*
Do. Classes 181 and 183	do.	5*s.*	5*s.*
Cider, Butter, and Cream	do.	2*s.* 6*d.*	5*s.*
Butter-making, Classes 195 to 197	do.		
Butter-making, Class 194	do.	1*s.*	1*s.*
Horse-Shoeing	do.	2*s.* 6*d.*	5*s.*
Milking	do.	2*s.* 6*d.*	2*s.* 6*d.*

2. Horses entered in the Harness Classes must be in the Yard by 2 P.M. on the day on which they compete, and, with the consent of the Stewards, may leave the Yard as soon as they have been judged. Entries of Harness Horses, if no Horse Box is required, must reach the Secretary not later than May 4. If a Box is required the Entry must reach the Secretary on or before April 4, or, at double fees, by April 11. The Entry Fees are—

		Members.	Non-Members.
Without Horse Box	for each Entry	5*s.*	10*s.*
With Horse Box	do.	10*s.*	20*s.*

3. No Exhibitor can make more than three Entries in any one Class of Horses, Cattle, Sheep, or Pigs.

4. No Entry will be received unless the Fee accompanies it, and (if the Exhibitor is a Member of the Society) the subscription for the year, unless previously paid, together with any arrears that may be due.

The privilege of entering at Members' Fees is strictly limited to Members of the Society elected on or before January 25, 1898, and subscribing not less than 1*l.* annually.

Where a Prize is offered for a *pair* or *pen* of Animals, Single Entry-fees are payable for each *pair* or *pen*, and only one Entry-form must be used.

All Entries must be made on the printed forms to be obtained of the Secretary (THOS. F. PLOWMAN, 4, Terrace Walk, Bath), and, in applying for forms Exhibitors are requested to state how many Entries they wish to make for Horses, Cattle, Sheep, Pigs, &c., as each Stock Entry must be on a separate Form.

'. Every Exhibitor or Competitor is requested to carefully examine the t of Prizes and Conditions, as he will be held responsible for the correct- s of his Certificate of Entry. An Exhibitor omitting to give information ed for on the Entry-form, with regard to the age, breeder, name, colour, , dam, &c., of an Animal, will be liable to have his Entry disqualified.

. If an Exhibitor or Competitor fails, when called upon by the Stewards Council, to prove the correctness of his Certificate of Entry to their satis- ion, the Entry may be disqualified, and any award made to it cancelled.

0. An Exhibitor who has made, in due time, an Entry of Horses, Cattle, ep, or Pigs in a particular Class, will be permitted, up to Friday, April 29, vithdraw the Entry of such Animal, and to substitute for it the Entry of ther Animal in the same Class, on payment of the difference, if any, veen the amount of the Entry-fee originally paid for the Animal withdrawn, the post Entry-fee.

1. An Animal entered in the Hackney or Pony Classes can, if eligible, be entered in the Harness Classes, provided notice is given on the ry-form and the additional Entry-fees be paid. Except in these and r Classes named in the Prize List an Animal cannot be entered in more 1 one Class.

2. Every Exhibit must be the *bonâ fide* property of the Exhibitor both at time of Entry and on the first day of the Exhibition.

SHOWYARD.

3. The Yard will be open for the reception of Horses (see Regulation 2 Harness Horses), Cattle, Sheep, and Pigs, on Monday and Tuesday, y 23 and 24, from 7 A.M. to 6 P.M. Horses will also be received from 8 o'clock on the morning of the first day of Show, but all other Stock ries must be in the Yard the previous day. A Label denoting the number each Entry will be sent by the Secretary, and must be securely affixed he head of the Animal, or, in the case of other Exhibits, to the receptacle taining such Exhibits.

4. All Live Stock (see Conditions 2, 38, and 39 for exceptions with regard Horses) must remain in their places in the Showyard until after six o'clock he afternoon of the last day of the Show, and shall under no circumstances aken out of their places in the interval without the special permission of Stewards.

5. All Exhibits and all persons in charge of the same, will be subject to Orders, Regulations, and Rules of the Society, and the Stewards shall e the power to remove from the Yard the Stock or property belonging to, to cancel the admission ticket of, any Exhibitor who shall infringe any he Regulations or Conditions of the Meeting, or who shall refuse to ply with any instructions given by the Stewards, without any responsi- y attaching to the Stewards or the Society in consequence of such oval.

3. The carriage of Exhibits must in all cases be paid by the Exhibitor. exhibit subject to charges will be received by the Officers of the Society.

7. No Animal shall be decorated with colours other than the Society's e Rosettes.

3. No person shall be allowed to fix any placard, or to take down any ial placard in the Yard without the written permission of the Stewards.

). All persons in charge of Exhibits will be subject to the orders of the ards, and will be required to parade or exhibit the Animals in their ge at such times as may be directed by the Stewards. Servants must be tendance each day during the Show at least a quarter of an hour before time appointed for exhibiting the Animals under their charge in the Show-rings. Owners of Animals exhibited will be held responsible for the behaviour of their Servants, and for the consequences of any misconduct of such Servants.

20. Servants in charge of Stock at night must, if they leave the Yard, return before 10 P.M., for they will not be admitted.

21. Hay, straw, and green food will be delivered to the Servants of Exhibitors free of expense at the Forage Stores in the Showyard, and they must take it to their respective Animals. Servants must apply at the Forage Stores for their Forage Tickets after they have brought their Animals into the Yard. Corn, meal, and cake can be obtained in the Showyard at fixed prices.

NOTE.—For the convenience of Exhibitors wishing to sell their Animals, a Register will be kept at the Secretary's Office, in which they may enter the prices.

TICKETS.

22. Each Exhibitor of Live Stock will have a Free Ticket of admission to the Showyard sent to him, except in the case of a Member of the Society, who will receive his Member's Ticket in lieu of an Exhibitor's Ticket. Tickets for the use of Servants in charge of Live Stock will also be sent, and the Exhibitor will be held responsible for the proper use of such Tickets. In case of transfer or other improper use of a Ticket, the Exhibitor will be required to pay a fine of 1*l.* for each case. Exhibitors will be held responsible for the attendance at each Parade of as many Servants as Tickets have been issued for.

RESPONSIBILITY.

23. Neither the Society nor any of its Officers or Servants shall be in any way responsible or accountable for anything that may happen (from any cause or circumstance whatever) to Exhibitors or their Servants, or to any Animal or Article exhibited, or property brought into the Showyard, or otherwise for anything else in connection with, or arising out of, or attributable to, the Society's Show, or these or any other Conditions or Regulations prescribed by the Society in relation thereto.

24. Each Exhibitor shall be solely responsible for any consequential or other loss, injury, or damage done to, or occasioned by, or arising from, any Animal or Article exhibited by him, and shall indemnify the Society against all legal or other proceedings in regard thereto.

25. The Society, its Officers, and Servants, will not be liable for any errors or mistakes that may happen in placing or penning the Stock or Articles to be exhibited, but the Servants in charge of the same must see that they are placed or penned according to their Entries.

DISQUALIFICATIONS.

26. No Animal which has been exhibited as Fat Stock at any Show shall be eligible to compete for the Prizes offered in this Prize Sheet.

27. No Animal which has taken a First Prize at any Meeting of this Society [illegible] compete again in the corresponding Class.

28. An Animal having any unsoundness likely to be transmitted to its progeny, shall be disqualified thereby from receiving any Prize offered by or through the Society.

29. If it shall be proved to the satisfaction of the Stewards or Council that [illegible] Exhibitor or Competitor has knowingly signed an incorrect Certificate, or knowingly given an incorrect Pedigree of any Animal, or has attempted to enter an Animal or other Exhibit, or to obtain a Prize by any other unfair

eans, the Council shall have the power to cancel all awards made to such xhibitor or Competitor and to disqualify him or her from exhibiting or com- ting at future Meetings of the Society.

30. No person who shall have been shown to the satisfaction of the Council have been excluded from exhibiting for Prizes at the Exhibition of any her Society in consequence of having attempted to obtain a Prize by giving false Certificate, or by other unfair means, and no person who is under xclusion from any Breed Society for fraudulent practices, shall be allowed to xhibit at this or any other Meeting of the Society.

PENALTIES.

31. As the non-exhibition of Animals entered for the Show causes unne- essary preparations and expense, and disarranges the Showyard, any person ntering Stock, and failing to exhibit the same shall pay a penalty of 10s. or each Entry, unless a Certificate, under the hand of the Exhibitor or his uthorised Agent, be lodged with the Secretary of the Society, before the day f Exhibition, certifying that such non-exhibition is caused either by—1) the death of the animal or animals; or (2) contagious or infectious isease (confirmed by the explanatory Certificate of a Veterinary Surgeon); r (3) by its becoming ineligible for the Class in which it has been entered.

32. Every Exhibitor will be required to undertake to forfeit and pay to the Society the sum of 20*l*., as and for liquidated damages, if any Animal which e exhibits be, to his knowledge, suffering from any contagious or infectious isease, and the Stewards are empowered to prevent the entry of any diseased nimal into the Yard, or to have it removed therefrom.

33. Any infringement of any of these or any other prescribed Regulations r Conditions will subject the Exhibitor to a fine of 1*l*. by the Stewards, and o the forfeiture, by order of the Council, of any Prize to which he may be ntitled (in addition to all other consequences attaching to such infringement).

AWARDS.

34. The Society reserves to itself the right to withhold any Prize, if, in he opinion of the Stewards, the conditions and regulations have not been roperly complied with.

35. No Second Prize will be given in any Class of Stock unless there are hree Entries exhibited, no Third Prize unless there are six Entries exhibited, nd no Fourth Prize unless there are nine Entries exhibited, except in the case f sufficient merit and on the special recommendation of the Judges, with the pproval of the Steward of the Department, at the time of Judging the Class.

36. The Certificate of the Veterinary Inspector, whether as to age or undness, shall be required only in cases where the Judges are in doubt, or here the Stewards may consider it necessary. The decision of the Inspector n such cases shall be final and conclusive; and in case it shall be against he Animal to which a Prize has been awarded, such Animal shall be isqualified from receiving such Prize.

PROTESTS.

37. Any Exhibitor wishing to lodge a protest having reference to Live tock exhibited at this Meeting must make the same in writing on a form to e obtained from the Secretary and deposit with him the sum of 3*l*. If on nvestigation the protest is not sustained to the satisfaction of the Stewards, he sum thus deposited shall, at the discretion of the Council, be forfeited to he funds of the Society. All protests must be delivered at the Secretary's ffice in the Showyard, on the day on which the award is made, and no pro-

test will be SUBSEQUENTLY received, unless a satisfactory reason be assigned for the delay. The Stewards will consider such protests at Eleven o'clock on the following day at the Secretary's Office, at which time and place any person making a protest must attend or be represented by his authorised agent. The decision of the Stewards shall be final.

APPLYING TO CERTAIN CLASSES ONLY.

HORSES.

38. Horses can be removed from the Yard at night on deposit by the Exhibitor of 3*l*. at the Finance Office, which sum will be forfeited if the Horse does not return at 8 A.M. each day during the Exhibition. This regulation does not apply to Harness Horses.

39. The Stallions in Classes 1, 2, and 10 are not required to remain in the Yard longer than 6 o'clock in the evening of the third day of the Show.

40. Exhibitors must provide saddles for Horses in Classes 18, 23, 24, 25, 29, 30, and 31, as they are to be ridden; and vehicles and harness for those in Classes 32, 33, 34, 35, 36, 37, 39, 40, and 41, which are to be driven.

41. No Horse, unless a Foal, will be admitted into the ring without proper bit.

42. The Prizes for Stallions in Classes 1 and 10 will be withheld until Certificate from the owner is delivered to the Secretary that the Horse ha served at least 20 Mares during the current season.

43. All Foals must be the offspring of the Mares with which they ar exhibited, and the name of the Sire of the Foal must be stated on the Certificate of Entry.

44. Mares entered as in-Foal shall hereafter be certified to have produced living Foal before the 1st August, or in Class 11 before July 1st, of the yea of the Show. If the required Certificate, which must be on a form obtainabl from the Secretary, is not received by September 30, 1898, the Prize awarde will be forfeited.

45. Horses may, at the discretion of the Stewards, be measured, and th measurement shall be taken in the shoes worn by the Entry at the time judging.

46. The following special conditions apply only to the Prize offered by th Shire Horse Society, viz.: the owner of the Animal entered to have been Member of the Bath and West and Southern Counties Society for not le than six months previous to April 11, 1898; a Mare six years old, or upward to have had a living Foal; no Animal to compete which has won the Shi Iorse Society's Gold Medal during the current year, the Royal and Lond Shows being excepted; the winning Animal to be entered, or eligible f ntry, in the Shire Horse Society's Stud Book; and a Certificate that she ree from hereditary disease to be lodged with the Secretary of the Shi orse Society, the Veterinary examination to be made on the ground by t erinary Inspector appointed for the Show.

7. The following Special Conditions apply only to the Prize offered Hunters' Improvement Society for Hunter Brood Mares, viz.:—T Iare awarded the Medal must be registered in the Society's Record unter Mares and Sires (or entered for Volume VIII.), and not havi eviously won the Hunters' Improvement Society's Gold Medal or Premi s a Brood Mare, possessing a Certificate of soundness from heredit lisease, signed on the ground by the local Society's appointed Veterin nspector, who must be a Member of the Royal College of Veterin Surgeons. n the case of Mares entered as "in-foal," a further Certificate

nust also be lodged with the Secretary of the Hunters' Improvement

.—If the Judges select a Brood Mare whose Entry for the Record was **before the date of the Associated Society's Show,** the Prize will be d to a Gold Medal and 1*l.*, or 5*l.* and a Silver Medal.

he following Special Conditions apply only to the Prize offered by iters' Improvement Society for Hunter Filly. The Filly awarded the iust be registered in the Society's Record of Hunter Mares and Sires ıred for Volume VIII.), and not having previously won the Hunters' ment Society's Silver Medal in 1898, possessing a Certificate of sound- m hereditary disease, signed on the ground by the local Society's d Veterinary Inspector, who must be a Member of the Royal College inary Surgeons.

.—If the Judges select a Filly whose Entry for the Record was **efore the date of the Associated Society's Show,** the Prize will be d to a Silver Medal and 1*l.*

CATTLE.

.ll Cattle must be properly secured to the satisfaction of the Officers lociety, on being brought to the gate of the Yard, or they will not be l.

.ll Bulls must have a ring or clamp attached to the nose, and in the ısses must be provided with a strong chain, and be led with a proper

.ll Cattle will be required to be paraded in the ring at least once a he discretion of the Stewards.

'o Bull calved before January 1, 1896, will be eligible to receive a ntil certified to have served not less than six different Cows (or , previous to June 1st, 1898, and to be the sire of live Calves in the year 1898.

'o Cow or Heifer, entered as in-milk, will be eligible to receive a Prize rtified to have had a living Calf within the fifteen months preceding of Show, or that the Calf, if dead, was born at the proper time.

'o Cow or Heifer, entered as in-Calf, will be eligible to receive a ntil certified to have produced a living Calf before January 1, 1899, the Calf, if dead, was born at full time before that date. If the Certificate, which must be on a form obtainable from the Secretary, ceived by February 1, 1899, the Prize awarded will be forfeited.

very Cow or Heifer in-milk shall be milked dry in the Showyard at n the evening preceding the day of judging, or, in the Milking and Test Classes, at such hours as the Stewards may appoint, in the pre- an Officer of the Society appointed for the purpose.

.ny Animal in the Cattle Classes found to be artificially coloured will alified.

.ny person selling Milk in the Yard, except in the place appointed by vards, will be fined 5*s.* for each infringement of this Regulation.

'he following Conditions apply to the Prizes offered in Class 55:— previous winner of one of these First Prizes to be eligible to compete. date of last Calving to be stated on Entry-form. (*c*) The Judges to ally requested to take into consideration the Milking qualifications of peting Animals, and in no case to award a Prize to any Animal that t exhibit *good Dairy qualities;* the object of these Prizes being to ge the production of the highest type of Shorthorn Dairy Cow, com- ood milking properties with robustness of constitution, and at the ne to *discourage* the exhibition of fat Animals.

59. The Blythwood Challenge Bowl when won two years in succession or three years at intervals, by different animals belonging to the same Exhibitor, will become absolutely his property. Any Animal having been awarded one of the "Blythwood Bowls" in 1898 will not be eligible to compete for a second in the current year. The possessor of the Bowl must give security to the Society that it shall be delivered up to the Secretary one week before the commencement of the Society's Show the following year; and in the event of the same Exhibitor not being the winner of the Bowl the second year, a Silver Medal will be given him by Sir James Blyth, as a memento of his success in the previous year.

60. The Challenge Cup offered by the Duke of Marlborough must be won twice by the same Exhibitor before becoming his absolute property. The possessor of the Cup must give security to the Society that it shall be delivered up to the Secretary one week before the commencement of the Society's Show the following year.

61. Except in the Local and Dairy Classes, every Animal entered for Competition must be entered, or certified as eligible to be entered, in the Herd Book of its Breed, where such Herd Book exists, and has been in existence for not less than seven years. Where an Animal is entered by the Exhibitor as eligible for Entry in the Herd Book of its Breed, proof of such eligibility must be furnished to the Secretary at the time of making the Entry.

SHEEP.

62. All Sheep over one year old must have been really and fairly shorn bare on or after the 1st of April, 1898. If the Judges consider that a Sheep has not been shorn bare they will report this to the Stewards, with a view to its disqualification.

63. Each pen of Ewes must be of the same Flock.

PIGS.

64. The Pair of Pigs in each pen must be of the same litter.

65. All Sows farrowed before 1898 shall be certified to have had a litter of live Pigs within six months preceding the first day of exhibition, or to be in-Pig at the time of entering, so as to produce a litter of Pigs, farrowed at their proper time, before the 1st of September following. In the case of in-Pig Sows the Prize will be withheld until the Exhibitor shall have furnished the Secretary with a certificate of farrowing as above. If the required Certificate, which must be on a form obtainable from the Secretary, is not received on or before the 15th September following, the Prize awarded will be forfeited.

66. All Pigs exhibited with a Sow shall be her own produce, of the same litter, and not exceeding two months old at the time of the Show.

67. No Sow above 18 months old that has not produced a litter of live Pigs shall be eligible to compete in any of the Classes.

68. Any Animal in the Pig Classes found to be artificially coloured will be disqualified.

[illegible]DER, DAIRY PRODUCE, MILKING, AND SHOEING.

For Conditions and Regulations see Entry-Forms.

ADJUDICATION OF PRIZES.

69. The Judges are instructed as follows, and Entries are received subject to this:—

a. Not to award any Prize or Commendation unless the Entry possesses sufficient merit.

b. Not to award a Prize to any Horse or Mare unless it is free from unsoundness likely to be transmitted to its progeny; or if a Gelding, unless free from unsoundness; in either case, an accident having temporary consequences only excepted.

c. In awarding Prizes to Cattle, Sheep, and Pigs, to decide according to the relative merits of the Animals for Breeding purposes, and not to take into consideration their present value to the butcher.

d. To draw the attention of the Stewards to any Exhibit that has been improperly prepared for exhibition or is wrongly entered.

e. To report to the Stewards for disqualification any Sheep which in their opinion has not been shorn bare.

f. To give in a "RESERVED NUMBER" in each Class, indicating the Animal or Exhibit which in their opinion possesses sufficient merit for the Prize, if the Animal or Exhibit to which the Prize is awarded should become disqualified. Should the "Reserve Number" succeed to a Prize, and be itself disqualified, the Prize will be forfeited.

g. Immediately after the Judging to deliver to the Stewards on the special sheets, to be obtained at the Secretary's Office, their awards, signed, stating the numbers to which the Prizes are adjudged, and noting all disqualifications.

70. Should any question arise upon which the Judges may desire a further opinion, the Stewards shall provide them with a Referee.

PAYMENT OF PRIZES.

71. Cheques for the Prizes awarded (except where further qualification of an Animal is required) will be drawn at the meeting of the Finance Committee held in July, 1898, and will then be forwarded by post to the Exhibitors to whom they have been awarded.

INTERPRETATION OF CONDITIONS.

72. The Society reserves to itself by its Council the sole and absolute right to interpret these or any other prescribed Conditions and Regulations, or Prize Sheets, and to arbitrarily settle and determine all matters, questions, or differences in regard thereto, or otherwise arising out of or connected with or incident to the Show. Also to refuse and to cancel any Entries, disqualify Exhibitors, prohibit exhibition of Entries, vary or cancel awards of Prizes or Reserved Numbers, and relax Conditions, as the Society may deem expedient.

RAILWAY ARRANGEMENTS.

The Railway Companies offer special facilities for the CONVEYANCE OF STOCK to and from the Show, and particulars of these will be supplied to Exhibitors by the Secretary.

Telegraphic Address—"PLOWMAN," BATH.

CARDIFF MEETING,

May 25, 26, 27, 28, and 30, 1898.

PRIZES FOR POULTRY.

Class	First Prize. £ s.	Second Prize. s. d.	Third Prize. s. d.
.—Cochin—Cock	1 10	15 0	10 0
2.—Ditto—Hen	1 10	15 0	10 0
3.—Brahma—Cock	1 10	15 0	10 0
4.—Ditto—Hen	1 10	15 0	10 0
5.—Langshan—Cock	1 10	15 0	10 0
6.—Ditto—Hen	1 10	15 0	10 0
7.—Plymouth Rock—Cock	1 10	15 0	10 0
8.—Ditto—Hen	1 10	15 0	10 0
9.—Wyandotte—Cock	1 10	15 0	10 0
10.—Ditto—Hen	1 10	15 0	10 0
11.—Orpington—Cock	1 10	15 0	10 0
12.—Ditto—Hen	1 10	15 0	10 0
13.—Minorca—Cock	1 10	15 0	10 0
14.—Ditto—Hen	1 10	15 0	10 0
15.—Leghorn—Cock	1 10	15 0	10 0
16.—Ditto—Hen	1 10	15 0	10 0
17.—Hamburg—Cock	1 10	15 0	10 0
18.—Ditto—Hen	1 10	15 0	10 0
19.—Dorking (Coloured)—Cock	1 10	15 0	10 0
20.—Ditto—Hen	1 10	15 0	10 0
21.—Dorking (Silver Grey)—Cock	1 10	15 0	10 0
22.—Ditto—Hen	1 10	15 0	10 0
23.—Dorking (White or Cuckoo)—Cock	1 10	15 0	10 0
24.—Ditto—Hen	1 10	15 0	10 0
25.—Old English Game—Cock	1 10	15 0	10 0
26.—Ditto—Hen	1 10	15 0	10 0
27.—Indian Game—Cock	1 10	15 0	10 0
28.—Ditto—Hen	1 10	15 0	10 0
29.—Malay—Cock	1 10	15 0	10 0
30.—Ditto—Hen	1 10	15 0	10 0
31.—French—Cock	1 10	15 0	10 0
32.—Ditto—Hen	1 10	15 0	10 0
33.—Any other Distinct Breed (not previously mentioned)—Cock	1 10	15 0	10 0
34.—Ditto—Hen	1 10	15 0	10 0
SPECIAL PRIZES.			
Offered by Captain J. C. Best.			
35.—Silver Grey Dorking—Cock and six Hens, bred in 1897 or 1898, the property of one Exhibitor. The Birds to be exhibited in an open run	**£5**	**£3**	**£2**

	First Prize.	Second Prize.	Third Prize.
CHICKENS OF 1898.			
LASS	£ s.	s. d.	s. d.
6.—Cochin, Brahma, Langshan, Plymouth Rock, Wyandotte, or Orpington—Cockerel	1 10	15 0	10 0
7.—Ditto—Pullet	1 10	15 0	10 0
8.—Minorca, Leghorn, Hamburg, or French—Cockerel .	1 10	15 0	10 0
9.—Ditto—Pullet	1 10	15 0	10 0
0.—Dorking, Game, Malay, or any other Distinct Breed (not previously mentioned)—Cockerel .	1 10	15 0	10 0
1.—Ditto—Pullet	1 10	15 0	10 0
LIVE TABLE POULTRY.			
2.—Pair of Cockerels of 1898, of any Pure Breed. .	1 10	15 0	10 0
3.—Ditto—Pullets	1 10	15 0	10 0
4.—Pair of Cockerels of 1898, of a first cross from any Pure Breeds	1 10	15 0	10 0
5.—Ditto—Pullets	1 10	15 0	10 0
EXTRA PRIZE.			
A SILVER CUP is offered by Mr. W. B. Tegetmeier for the Best Pair of Cockerels or Pullets in Class 42, 43, 44, or 45.			
SELLING CLASSES.			
6.—Any Distinct Breed—Cock (*price not to exceed* 1*l.* 1*s.*)	1 10	15 0	10 0
7.—Any Distinct Breed—Hen (*price not to exceed* 1*l.* 1*s.*)	1 10	15 0	10 0
BANTAMS.			
8.—*Black Rosecomb—Cock or Hen, Cockerel or Pullet, the property of an Exhibitor residing within seven miles of the Town Hall, Cardiff*	*0 12*	*6 0*	*3 0*
The Prizes in Class 48 are offered by Mr. A. E. Morgan.			
DUCKS, GEESE, AND TURKEYS.			
9.—Drake or Duck (Aylesbury)	1 10	15 0	10 0
0.—Ditto (Rouen)	1 10	15 0	10 0
1.—Ditto (Pekin)	1 10	15 0	10 0
2.—Gander	1 10	15 0	10 0
3.—Goose	1 10	15 0	10 0
4.—Turkey—Cock	1 10	15 0	10 0
5.—Ditto—Hen	1 10	15 0	10 0

DEAD TABLE POULTRY.

(To be forwarded alive, and to be killed and plucked by a Poulterer employed by the Society. See Regulation 12.)

Class	First Prize.	Second Prize.	Third Prize.
	£ s.	s. d.	s. d.
56.—Pair of Cockerels of 1898, of any Pure Breed . .	1 10	15 0	10 0
57.—Ditto—Pullets	1 10	15 0	10 0
58.—Pair of Cockerels of 1898, of a first cross from any Pure Breeds	1 10	15 0	10 0
59.—Ditto—Pullets	1 10	15 0	10 0
60.—Pair of Ducklings of 1898	1 10	15 0	10 0
EXTRA PRIZE.			
A SILVER CUP is offered by Sir Walter Gilbey, Bart., for the Best Pair of Cockerels, Pullets, or Ducklings in Class 56, 57, 58, 59, or 60.	. . .	. .	

POULTRY.

CONDITIONS AND REGULATIONS.

Charges, &c.

1. Exhibitors may make an unlimited number of Entries in each Class on payment of Fees as follows:—

	Members.	Non-Members.
	s. d.	s. d.
Classes 48 (Bantams) and 56 to 60 (Dead Poultry) .	1 0	2 6
All other Classes	2 6	5 0

The above Fees include coops, food, and attendance.

N.B.—The above Fees *must* be sent with the Entries, or no notice will be taken of the latter.

2. The privilege of entering at Member's Fees is strictly limited to Members of the Society elected on or before January 25, 1898, and subscribing not less than £1 annually.

All Entries must be made on the printed forms, to be obtained of the Secretary Thos. F. Plowman, 4, Terrace Walk, Bath), and such forms must be correctly filled up and returned to the Secretary, together with all Fees due, on or before April 30. Exhibitors are requested to carefully examine the List of Prizes and Conditions, as the Society cannot be responsible for any errors made by Exhibitors in the Entry-forms, and birds entered in a wrong Class will be necessarily excluded from competition. No alterations can be made in Entry-forms after they have been received by the Secretary.

4. The Council reserve the right to refuse the Entries of any person.

5. Exhibitors must state the price and breed of their birds on their Entry-forms.

SHOWYARD.

ɔirds must be in the Showyard by 6 P.M. *on Tuesday, May* 24, and no bird moved before Monday, May 30, at 7 P.M. Any Exhibitors who send for ı must do so between 7 and 8 P.M. on that day.

carriage must be prepaid to Cardiff Railway Station, otherwise the not be received at the Exhibition; but they will be conveyed free of om the Station to the Showyard and back.

:xhibitor or Servant will be allowed into the tent until the birds have been

Poultry Tent will not be open to the public until 2 o'clock on the first day ıibition.

Non-Transferable Admission Ticket for the Exhibition will be sent to each whose Entry-fees amount to 1*l.* and upwards.

TABLE POULTRY.

these Classes (42 to 45 and 56 to 60) quality for the table will be con- efore mere weight. The date of hatching must be given, and, in the case red birds, the breeds of the parents.

Classes 56 to 60 the whole of the birds will be first exhibited alive. They ə killed on the evening of Wednesday, May 25, and trussed by a qualified , the Prizes being finally awarded to the dead birds. These will then all .ed, but will be withdrawn from exhibition when considered necessary, and, , will be returned to Exhibitors after 6 P.M. on Friday, May 27. s are recommended to put a reasonable price upon their Exhibits in these as to promote the sale of them.

SALES.

l birds may be claimed, at the price put upon them, any time after 4 o'clock esday, May 25, and a sale *must take place* if the price stated be paid to the the Poultry Office at the time of claiming. *No alteration can be made in s stated on the Entry-forms* and in the Catalogue until after Friday, when the price may be reduced on payment to the Stewards of 1*s.* per pen alteration. Birds must be *sold in pens*, and the price stated must include ət. A charge of 10 per cent. will be made for all birds sold. The persons : the management of the sales cannot take charge of birds which are ɔf privately.

AWARDS.

cept under a special recommendation from the Judges, no Second Prize will in any of the Classes unless there are three Entries, and no Third Prize ere are six Entries.

DISQUALIFICATIONS.

e Judges are empowered to withhold a prize or prizes where birds are not d of sufficient merit, or to disqualify any that have been clipped, drawn, marked, or dyed, and an Exhibitor detected in a false statement as to the of any bird, or in any other practice calculated to deceive or mislead the r Stewards, shall forfeit all or any Prizes awarded to him or her at the d will be disqualified from competing at any future Show of the Society.

ı person who shall have been shown to the satisfaction of the Council to ı excluded from exhibiting for Prizes at the Exhibition of any other Society uence of having attempted to obtain a Prize by giving a false Certificate, or unfair means, and no person who is under exclusion from any Breed Society ulent practices, shall be allowed to exhibit at this or any other Meeting of ty.

ıhealthy birds will not be exhibited, but will be immediately returned to ners, and the Fees will be forfeited.

PROTESTS.

18. In order to check frivolous and vexatious protests, no protest will be entertained unless accompanied by a deposit of 1*l.* in each case; and in case the protest is not substantiated, the deposit may be forfeited to the funds of the Society. All protests must be made before 12 o'clock (noon) on Thursday, May 26.

FORFEITS.

19. Persons entering birds, and failing to send the same to the Exhibition, will forfeit the entrance Fee for each pen so left vacant.

GENERAL.

20. All birds shown must be *bonâ fide* the property of the Exhibitor.

21. For each pen entered, the Exhibitor will receive a Label, on the reverse side of which he must legibly write his name and address for the return journey.

22. All Eggs laid at the Exhibition will be destroyed.

23. The Stewards pledge themselves to take every care of the birds exhibited, but neither they nor the Society will, in any case, be responsible for any accident, loss, or damage, from whatever cause arising, the Exhibits being entered at the sole risk of the Exhibitors, and Exhibitors will be required to hold the Society harmless in the event of loss.

24. In case of death of any bird during the Exhibition, it will be sent back for the inspection of the Exhibitor.

25. The Poultry Department is subject to the Rules and Regulations of the Society and its Officers.

⁂ *The use of properly-constructed Poultry Baskets will facilitate the safe and speedy conveyance of the birds to and from the Exhibition.*

The Society cannot, under any circumstances, undertake to send telegrams to Exhibitors as to Judges' Awards.

Applications for Catalogues (price 1*s. each) and printed lists of Awards should be made only to the Publishers,* Messrs. W. LEWIS AND SONS, *Herald Office, Bath.*

By Order of the Council,
THOMAS F. PLOWMAN, *Secretary.*

4, *Terrace Walk, Bath.*
Telegraphic Address—"PLOWMAN, BATH."

Year.	Place Visited.	Local Subscription.	Prizes.			Total Local Contribution.	President.	Admissions.		
			Local Committee.	Local Societies.	Local Residents.			On 2*s.* 6*d.* days.	On 1*s.* Days.	Total.
		£	£	£	£	£				
1852	Taunton . . .	210	..	..	..	210	Lord Portman.	..	..	..
1853	Plymouth . . .	450	..	..	..	450	Sir T. D. Acland, Bart.	..	..	..
1854	Bath	450	..	..	..	450	William Miles, M.P.	.	..	..
1855	Tiverton . . .	450	..	..	..	450	Earl Fortescue	..	..	..
1856	Yeovil	450	..	..	..	450	C. A. Moody, M.P.	..	..	..
1857	Newton Abbot . .	700	..	..	..	700	Lord Courtenay	..	..	..
1858	Cardiff	800	..	..	..	800	Lord Courtenay	..	..	..
1859	Barnstaple . . .	800	85	..	81	966	John Sillifant.	..	..	..
1860	Dorchester . . .	900	..	..	..	900	Lord Rivers	10,709	11,949	22,658
1861	Truro	900	..	..	..	900	J. W. Buller, M.P.	15,201	14,220	29,421
1862	Wells	900	..	..	..	900	Sir T. D. Acland, Bart.	10,578	4,775	15,353
1863	Exeter	900	..	..	..	900	Marquis of Bath	15,635	19,284	34,919
1864	Bristol	1000	106	..	50	1156	Earl Fortescue	22,377	65,678	88,055
1865	Hereford . . .	900	358	..	..	1258	Lord Taunton.	16,575	35,261	51,836
1866	Salisbury . . .	900	57	..	..	957	Earl of Portsmouth	7,288	18,737	26,025
1867	Salisbury . . .	..					J. Tremayne	7,502	16,702	24,204
1868	Falmouth . . .	900	..	..	..	900	Sir J. T. B. Duckworth, Bart. . .	11,393	19,495	30,888
1869	Southampton . .	900	132	..	18	1050	Earl of Carnarvon	15 340	41,290	56,630
1870	Taunton . . .	900	..	..	..	900	Sir S. H. Northcote, Bart., C.B., M.P.	17 952	33,653	51,605
1871	Guildford . . .	900	110	..	..	1010	Earl of Cork	10,656	23,406	34,062
1872	Dorchester . . .	800	..	..	10	810	Duke of Marlborough, K.G. . . .	12,791	21,517	34,308
1873	Plymouth . . .	800	..	400	..	1200	Earl of Mount-Edgcumbe . . .	16,665	45,744	62,409
1874	Bristol	800	403	..	..	1203	Sir Massey Lopes, Bart., M.P. . .	37 329	72,791	110,120

ANNUAL EXHIBITIONS—*continued.*

Year.	Place Visited.	Local Subscription.	Prizes.			Total Local Contribution.	President.	Admissions.		
			Local Committee.	Local Societies.	Local Residents.			On 2*s.* 6*d.* days.	On 1*s.* Days.	Total.
		£	£	£	£	£				
1875	Croydon	800	245	..	..	1045	R. Benyon, M.P.	14,518	26,028	40,546
1876	Hereford . . .	800	381	..	..	1181	Earl of Ducie	16,396	32,645	49,041
1877	Bath	800	215	..	..	1015	Marquis of Lansdowne	27,625	48,852	76,477
1878	Oxford	800	..	170	6	976	Earl of Jersey.	12,414	26,995	39,409
1879	Exeter	800	..	..	10	810	Earl of Morley	14,634	40,533	55,167
1880	Worcester . . .	800	..	254	..	1054	Earl of Coventry	8,415	37,675	46,090
1881	Tunbridge Wells .	800	245	34	..	1079	Marquess of Abergavenny . . .	13,368	33,236	46,604
1882	Cardiff	800	200	198	17	1215	Lord Tredegar	23,941	38,680	62,621
1883	Bridgwater . . .	800	78	..	..	878	Lord Brooke, M.P.	17,171	31,241	48,412
1884	Maidstone . . .	800	310	33	75	1218	Viscount Holmesdale.	13,501	31,053	44,554
1885	Brighton . . .	800	227	33	82	1142	Viscount Hampden	9,637	39,851	49,488
1886	Bristol	800	525	..	..	1325	Lord Carlingford	29,580	70,999	100,579
1887	Dorchester . . .	800	..	112	..	912	Earl of Ilchester	8,860	29,846	38,706
1888	Newport (Mon.) .	800	100	..	..	900	Lord Tredegar	14,878	38,567	53,445
1889	Exeter	800	..	..	10	810	Lord Clinton	16,405	36,195	52,600
1890	Rochester . . .	800	294	..	26	1120	Earl of Darnley	3,480	48,314	51,794
1891	Bath	800	50	103	100	1053	Earl Temple	23,510	52,185	75,695
1892	Swansea . . .	800	200	100	10	1110	Sir J. T. D. Llewelyn, Bart.. . .	18,364	54,609	72,973
1893	Gloucester . . .	800	400	..	..	1200	Lord Fitzhardinge	14,272	40,368	54,640
1894	Guildford . . .	800	174	..	10	984	Earl of Onslow	8,671	29,813	38,484
1895	Taunton . . .	800	85	160	10	1055	Viscount Portman	13,181	30,111	43,292
1896	St. Albans . . .	800	152	..	..	952	Earl of Clarendon	12,056	22,380	34,436
1897	Southampton . .	800	50	..	..	850	Lord Montagu of Beaulieu . . .	8,284	33,750	42,034
1898	Cardiff	800					Lord Windsor.			

FINANCIAL STATEMENT

FOR

1897

WITH ITEMS OF 1896 *FOR COMPARISON.*

PAGES
Summary of the Cash Account .. .. cx–cxi
Detailed Cash Account .. .. cxii–cxxiii
Assets and Liabilities cxxiv

The Bath and West

SUMMARY OF THE CASH AC

Dr. **WITH COMPA**

Page of accompanying Cash Account.	RECEIPTS.	£ s. d.	1897. Southampton. £ s. d.	£ s. d.	S
	General Receipts:—				
cxii	Dividends and Interest		610 3 7		
cxii	Subscriptions from Members		1,151 6 0		1,
cxii	Life Compositions		20 0 0		
cxii	Journal		42 9 2		
cxii	Miscellaneous		0 8 0		
				1,824 6 9	1,
	Show Receipts:—				
cxii	Implements		1,503 18 11		1,
cxiv	Horses	190 18 9			
cxiv	Cattle, Sheep, and Pigs	449 5 0			
cxiv	Catalogues, &c.	81 6 10			
			721 10 7		1,
cxiv	Poultry		100 1 0		
cxiv	Horse Shoeing		14 10 0		
cxvi	Arts	5 5 0			
cxvi	Art Union	89 6 6			
cxvi	Art-Manufactures	89 1 6			
			183 13 0		
cxvi	Cheese and Butter		143 18 2		
cxvi	Working Dairy		102 14 2		
cxviii	Sheep Shearing		5 5 0		
cxviii	Cider		9 0 0		
cxviii	Admissions		2,623 0 0		2
cxviii	Refreshment Contracts		521 10 6		
cxviii	Unapportionable:—				
	Cloak Rooms, &c.	48 2 0			
	Stand Fittings	185 13 8			
			233 15 8		
cxviii	Subscription from Cardiff for 1898 Show		800 0 0		
				6,962 17 0	7,
cxxii	Schools		..	1,324 19 8	3,
cxxii	Experiments		..	306 0 6	
cxxii	Sale of India Stock (£1,847 4*s.* 7*d.*)		..	2,000 0 0	1,
				12,418 3 5	14,
cxxii	Balance in Bank, Jan. 1, 1897		..	420 12 11	
				£12,838 16 4	14

thern Counties Society.

THE YEAR ENDING DEC. 31ST, 1897.

MENT FOR 1896.

CR.

PAYMENTS.		1897. SOUTHAMPTON.		1896. ST. ALBANS.
		£ s. d.	£ s. d.	£ s. d.
General Expenses :—				
Salaries		775 0 0		775 0 0
Rent, Postage, Stationery, &c.		259 6 6		268 11 1
Journal		434 8 5		421 2 2
			1,468 14 11	1,464 13 3
Show Expenses :—				
Implements		509 3 8		555 9 3
	£ s. d.			
Horses	850 0 2			1,133 6 6
Cattle, Sheep, and Pigs	2,317 10 5			2,116 4 10
Fodder, &c.	419 6 4			405 11 10
		3,586 16 11		3,655 3 2
Poultry		249 7 3		272 3 6
Horse Shoeing		88 5 11		81 1 11
Arts	207 1 0			196 12 3
Art Union	174 3 9			168 9 9
Art-Manufactures	70 16 7			69 10 10
		452 1 4		434 12 10
Music		222 3 0		250 12 0
Horticulture		159 6 8		155 16 9
Cheese and Butter		379 0 1		388 15 9
Working Dairy		455 4 8		529 19 11
Sheep Shearing		37 7 6		30 12 6
Cider		68 7 9		51 5 4
Bees		10 0 0		10 0 0
Public Announcements		416 4 1		418 3 11
Refreshment Contracts		235 8 0		153 19 4
Unapportionable :—				
Stand Fittings	64 7 0			92 0 0
Erection of Offices, &c.	1,077 14 9			893 3 10
Carriage of Plant	135 1 4			320 4 9
Police	106 15 0			110 12 6
Miscellaneous	346 6 0			331 10 6
		1,730 4 1		1,747 11 7
			8,599 0 11	8,735 7 9
chools		..	1,933 9 3	2,991 7 10
xperiments		..	716 19 2	686 17 8
			12,718 4 3	13,878 6 6
Balance due to Bank, Jan. 1, 1896		..	..	338 4 6
Balance in Bank, Dec. 31, 1897		..	120 12 1	420 12 11
			£12,838 16 4	14,637 3 11

ed and found correct,
ALBERT GOODMAN, F.C.A.,
Auditor.
13th, 1898.

Passed by Council,
January 25th, 1898.
THOS. F. PLO

The Bath and West

Dr. CASH ACCOUNT FOR THE YEAR ENDING DEC.

RECEIPTS.	1897. Southampton. £	s.	d.	£	s.	d.
DIVIDENDS AND INTEREST:—						
Consols	100	1	2			
New Zealand Stock	53	1	0			
India Stock	213	13	11			
Canada Stock	69	4	8			
Queensland Stock	106	7	8			
New South Wales Stock	67	15	2			
				610	3	7
SUBSCRIPTIONS FROM MEMBERS:—						
Arrears	59	14	0			
Governors	228	13	0			
Subscribers of £1 and upwards	842	8	0			
Ditto of 10s.	20	11	0			
				1,151	6	0
LIFE COMPOSITIONS	..			20	0	0
JOURNAL:—						
Sales	13	15	11			
Advertisements	28	13	3			
				42	9	2
MISCELLANEOUS	..			0	8	0
IMPLEMENTS:—						
Entry Fees	60	0	0			
Fees for Space:—						
Machinery-in-Motion Shedding	301	10	0			
Ordinary Shedding	360	10	0			
Miscellaneous Shedding	253	17	6			
Boarded Shedding	241	17	6			
Seed Shedding	36	10	0			
Uncovered Ground	132	5	8			
Catalogue Fees	117	8	3			
				1,503	18	11
Carried forward	..		£	3,328	5	8

thern Counties Society.

WITH COMPARATIVE STATEMENT FOR 1896. Cr.

PAYMENTS.	1897. Southampton.						1896. St. Albans.		
	£	s.	d.	£	s.	d.	£	s.	d.
ENERAL:—									
Salaries:—									
Secretary (including Clerks, Gas, Coal, Lodgings at Show, &c.)	700	0	0				700	0	0
Auditor	20	0	0				20	0	0
Consulting Chemist	30	0	0				30	0	0
Consulting Botanist	25	0	0				25	0	0
				775	0	0	775	0	0
Printing	37	11	3				39	2	6
Stationery and Finance Books	44	7	9				40	18	9
Postage, Telegrams, Cheque and Receipt Stamps	66	10	9				79	2	0
Rent of Offices	26	0	0				26	0	0
Travelling Expenses	28	19	6				24	13	4
Carriage of Goods	11	7	6				11	8	9
Directories and Reference Books	5	11	6				5	9	6
Finance Committee's Expenses	15	13	9				8	8	0
Subscriptions	3	3	0				3	3	0
Repairs, &c.	15	17	6				3	1	3
Hire of London Rooms for Councils and Committees	4	4	0				4	4	0
Grant to Mrs. Janes (widow of late Foreman of Plant)	..						23	0	0
				259	6	6	268	11	1
JOURNAL:—									
Editor	100	0	0				100	0	0
Associate Editor	100	0	0				100	0	0
Printing and Binding	157	5	4				153	0	9
Plans	3	14	6				3	14	6
Journal Distribution	31	5	3				27	15	7
Postage, Stationery, Reference Books, &c.	7	10	4				6	9	4
Payments to Authors	34	13	0				30	2	0
				434	8	5	421	2	2
IMPLEMENTS:—									
Shedding	423	4	0				450	6	9
Stewards and Assistants	60	2	8				66	12	0
Printing, Stationery, &c.	25	17	0				38	10	6
				509	3	8	555	9	3
Carried forward	..			£ 1,977	18	7			

Dr. CASH ACCOUNT—*continued.*

RECEIPTS.		1897. SOUTHAMPTON.		18 ST. A
	£ s. d.	£ s. d.	£ s. d.	£
Brought forward . . .		..	3,328 5 8	
HORSES, CATTLE, SHEEP, AND PIGS:—				
Horses:—Entry Fees	109 0 0			189
Fines and Forfeits . .	3 10 0			12
Grand Stand Admissions .	58 8 9			113
Special Prizes . . .	20 0 0			122
		190 18 9		436
Cattle, Sheep and Pigs:—				
Entry Fees. . . .	350 15 0			342
Fines	17 0 0			26
Special Prizes . . .	81 10 0			89
		449 5 0		458
Catalogues	80 8 10			80
Manure and Fodder	0 18 0			24
		81 6 10		105
			721 10 7	1,000
POULTRY:—				
Entry Fees		98 0 0		101
Commission on Sales		2 1 0		2
			100 1 0	103
HORSE-SHOEING:—				
Entry Fees . .		..	14 10 0	11
Carried forward . .		... £	4,164 7 3	

CASH ACCOUNT—*continued.* Cr.

PAYMENTS.	£ s. d.	£ s. d.	1897. Southampton. £ s d.	1897. Southampton. £ s. d.	1896. St. Albans. £ s. d.
Brought forward . . .			..	1,977 18 7	
HORSES, CATTLE, SHEEP, AND PIGS:—					
Horses—Prizes		477 0 0			620 0 0
Shedding and Grand Stand		309 10 10			444 5 6
Stewards and Assistants		41 6 4			46 13 6
Judges		22 3 0			19 7 6
Miscellaneous . .		..			3 0 0
			830 0 2		1,133 6 6
Cattle—Prizes .	1,101 10 0				1,210 10 0
Less deferred	35 0 0				30 0 0
		1,066 10 0			1,180 10 0
Sheep—Prizes		448 0 0			446 0 0
Pigs—Prizes		222 0 0			..
Shedding and Canvas .		391 12 4			311 2 2
Stewards and Assistants.		32 11 6			36 5 2
Judges		156 16 7			132 7 6
Grant to British Goat Society		..			10 0 0
			2,317 10 5		2,116 4 10
Canvas, &c.		42 4 8			41 14 11
Fodder		221 8 1			201 4 6
Steward of Fodder and Assistants and Horse hire . . .		22 7 4			29 19 8
Veterinary Inspector. . .		27 7 0			17 15 6
Rosettes		7 10 5			8 9 7
Printing and Stationery . .		58 17 11			60 18 8
Refreshments to Judges . .		9 10 11			10 9 0
Deferred Prizes of 1896 . .		30 0 0			35 0 0
			419 6 4		495 11 10
				3,586 16 11	3,655 3 2
POULTRY:—					
Marquee, Staging and Sheds			57 15 0		59 14 3
Stewards and Assistants			19 1 1		22 5 10
Judges			12 9 0		12 12 2
Prizes			145 15 0		166 5 0
Printing, Stationery, Cartage, &c. . . .			14 7 2		11 6 3
				249 7 3	272 3 6
HORSE-SHOEING:—					
Prizes			22 0 0		22 0 0
Judges			18 6 0		18 18 1
Anvils, Forges, Coals, Horses, and Printing. .			6 19 10		5 11 7
Shedding			32 10 0		30 17 3
Steward and Assistants			8 10 1		3 15 0
				88 5 11	81 1 11
Carried forward . . .			.. £	5,902 8 8	

DR. CASH ACCOUNT—*continued.*

RECEIPTS.		1897. Southampton.		189 St. Al
		£ s. d.	£ s. d.	£ s.
Brought forward		..	4,164 7 3	
ARTS:—				
Catalogues and Commissions on Sales . . .		5 5 0		7 1
Returned on Picture		..		2
			5 5 0	10
ART UNION:—				
Sale of Tickets		81 14 0		65
Excess paid on Prizes.		7 12 6		8
			89 6 6	73
ART-MANUFACTURES:—				
Fees for Space		..	8 1 6	24
CHEESE AND BUTTER:—				
Entry Fees		115 2 6		91
Cheese and Butter Sales		28 15 8		26
Special Prizes		..		18
			143 18 2	136
WORKING DAIRY:—				
Admissions		4 3 6		9
	£ s. d.			
Entry Fees, Competitions .	26 6 6			36
Ditto Dairy Appliances	7 6 0			31
Ditto Butter Test Prizes	3 12 0			44
		67 4 6		106
Special Prizes		..		11
Premium on [illegible] &c. . .		31 6 2		16
			102 14 2	146
Carried forward		..	£4,594 12 7	

CASH ACCOUNT—*continued.* Cr.

PAYMENTS.	1897. Southampton.		1896. St. Albans.
	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	5,902 8 8	
and Fittings	57 0 0		57 3 11
and Assistants	35 2 8		47 7 5
g and re-packing Pictures . . .	41 18 6		41 13 10
gents and Carriage	63 17 1		40 4 1
; and Stationery	9 2 9		10 3 0
		207 1 0	196 12 3
N :—			
Purchased	161 9 3		156 9 3
; and Stationery	5 16 6		6 0 0
sing	2 2 0		2 2 0
sion on Sale of Tickets	4 16 0		3 18 6
		174 3 9	168 9 9
UFACTURES :—			
and Fittings	60 10 7		59 6 0
l and Assistants	6 10 0		7 8 4
g	3 16 0		2 16 6
		70 16 7	69 10 10
nd their Fares	200 11 0		230 0 0
g Band Stands and Seats	19 12 0		18 2 0
l	2 0 0		2 10 0
		222 3 0	250 12 0
TURE :—			
ies to Gardeners	80 0 0		80 0 0
g and Repairing Tent and Staging . .	60 0 0		55 17 3
l and Assistants	19 6 8		19 19 6
		159 6 8	155 16 9
ND BUTTER :—			
. . . .	11 0 6		11 7 5
. . . .	237 0 0		260 0 0
ls and Assistants	13 19 3		13 6 1
g	106 18 9		95 13 3
g, Stationery, Carriage, &c.	5 1 7		3 9 0
able for Butter	5 0 0		5 0 0
		379 0 1	388 15 9
DAIRY :—			
ls and Assistants	72 5 8		81 2 1
and Demonstrators	52 3 4		51 6 8
g	237 4 9		298 14 0
g, Stationery, Postage, and Insurance .	9 7 9		6 6 10
s, Carriage, &c.	19 1 7		16 9 8
. . . .	57 0 2		68 19 2
alt, Ice, &c.	8 1 5		7 1 6
		455 4 8	529 19 11
Carried forward . . .	.. £	7,570 4 5	

CASH ACCOUNT—*continued.*

RECEIPTS.	1897. SOUTHAMPTON. £	s.	d.	£	s.	d.	189 St. Al £	s.
Brought forward	..			4,594	12	7		
SHEEP SHEARING:—								
Entry Fees	..			5	5	0	5	1
CIDER:—								
Entry Fees	..			9	0	0	11	
ADMISSIONS TO SHOW-YARD:—								
Admissions at 2*s.* 6*d.*	950	12	6				1,387	1
Ditto at 1*s.*	1,513	15	0				1,039	
Children at 1*s.*	28	7	0				30	1
Ditto at 6*d.*	86	15	6				43	1
Season Tickets	43	10	0				78	1
				2,623	0	0	2,579	1
SHOW REFRESHMENT CONTRACTS:—								
Sale Premiums and Buildings	..			521	10	6	500	
SHOW RECEIPTS (UNAPPORTIONABLE):—								
Stand-fittings	185	13	8				206	1
Cloak Room, Parcels Office, Chairs, Photographs, &c.	48	2	0				48	1
				233	15	8	256	1
SUBSCRIPTIONS FROM TOWNS:—								
Cardiff, for 1898 Show.	..			800	0	0	800	
Carried forward	..		£	8,787	3	9		

CASH ACCOUNT—*continued.* Cr.

PAYMENTS.	1897. Southampton.		1896. St. Albans.
	£ s. d.	£ s. d.	£ s. d.
Brought forward	..	7,570 4 5	
EARING:—			
	18 10 0		17 0 0
	5 19 0		7 2 0
	1 0 0		1 0 0
g, Sheep and Printing	11 18 6		5 10 6
		37 7 6	30 12 6
g and Fittings.	29 4 0		28 13 6
and Assistants	9 15 8		9 7 0
	7 0 0		7 10 3
	8 12 1		1 2 10
, &c.	2 16 0		4 11 9
s	11 0 0		..
		68 7 9	51 5 4
om Council for Bee Tent	..	10 0 0	10 0 0
NOUNCEMENTS:—			
ding	181 6 3		163 4 11
ng	153 5 3		159 12 11
	77 12 7		91 6 1
Placard-Frame Stores	4 0 0		4 0 0
		416 4 1	418 3 11
RESHMENT CONTRACTS:—			
g	231 10 6		150 5 4
, &c.	3 17 6		3 14 0
		235 8 0	153 19 4
ENSES (UNAPPORTIONABLE):—			
Offices and other Buildings	879 3 1		739 5 9
Hoarding	198 11 8		153 18 1
of Plant	135 1 4		147 12 5
to (1895)	..		172 12 4
of Works	12 4 6		14 5 6
ttings	64 7 0		92 0 0
n of Telegraph Wires	8 17 5		10 17 4
e of Plant	4 10 0		4 10 0
urniture	13 19 6		28 4 6
om, &c.	6 8 3		5 5 0
ers	65 9 0		65 14 4
, Messengers, &c.	16 6 8		20 17 11
of Finance and Treasurer	23 2 0		21 19 8
Office and Treasurer's Clerks	40 1 0		49 9 10
	106 15 0		110 12 6
c.	3 16 7		2 4 9
es for Press and Officials	6 8 0		19 2 6
of Plant	55 14 2		25 16 1
and Stationery	32 5 2		37 17 1
ion on Sale of Season Tickets.	1 1 9		4 15 3
nd Sundries	6 2 0		20 10 9
pton Jubilee Fund.	50 0 0		..
		1,730 4 1	1,747 11 7
Carried forward	..	£10,067 15 10	

DR. CASH ACCOUNT—*continued.*

RECEIPTS.		1897. Southampton.		189 St. Al
		£ s. d.	£ s. d.	£
Brought forward . . .		..	8,787 3 9	
SCHOOLS:—				
Somerset Farriery:—	£ s. d.			
Students' Fees	8 17 6			11
Grant from County Council . .	268 14 1			419
		277 11 7		431
Somerset Butter		..		21
Somerset Cheese:—				
Students' Fees	99 12 6			88
Cheese and Butter sold . . .	369 16 4			730
Sale of Cheese-making Apparatus . .	28 0 0			49
Sale of Students' Note-Books . .	1 14 6			1
		499 3 4		870
Grant from County Council		174 17 3		300
Devon Butter:—				
Students' Fees	24 7 6			25
Spectators' Admissions .	7 11 10			7
Sale of Appliances	0 8 6			2
		32 7 10		35
[illegible]		300 0 0		100
Carried forward . . . £		1,284 0 0	8,787 3 9	

CASH ACCOUNT—*continued*. Cr.

PAYMENTS.		1897. Southampton.		1896. St. Albans.
		£ s. d.	£ s. d.	£ s. d.
Brought forward . . .		..	10,067 15 10	
CHOOLS:—				
Somerset Farriery:—	£ s. d.			
Wages and Instructor's Travelling Expenses	142 10 9			132 9 9
Coal, Iron, &c.	16 1 0			18 5 7
Carriage and Cartage . . .	27 4 3			14 13 7
Rent of Yards and hire of Horses .	14 7 0			12 1 6
Prizes and Judges at Competition .	14 14 3			18 19 8
Veterinary Surgeon . . .	31 10 0			31 10 0
Printing, Stationery, Postage, and Office and Travelling Expenses .	58 18 3			48 8 10
Plant and Fittings	2 0 6			1 2 0
		307 6 0		277 10 11
Somerset Butter		..		216 13 10
Somerset Cheese:—				
Salaries and Expenses . . .	130 6 0			129 6 10
Steward's Time and Expenses . .	43 13 6			54 17 7
Supervisor's Expenses . . .	15 0 0			15 0 0
Bailiff's Wages	51 2 7			48 15 0
Office Staff and Travelling . .	15 12 3			11 17 2
Milk	542 1 6			638 17 0
Rennet, Bandages, Coal, Salt, &c. .	14 11 11			16 3 2
Carriage of Plant	3 8 7			4 5 5
Printing, Stationery, Advertising, Postages and Telegrams . .	9 16 7			10 6 4
Students' Board	70 4 0			51 16 0
Repairing and replacing Plant and Fittings	49 6 5			100 10 6
		945 3 4		1,081 15 0
Devon Butter:—				
Salaries and Expenses . . .	197 18 8			211 0 8
Steward's and Judges' Time and Expenses	138 8 10			128 17 10
Office Staff and Travelling . .	27 10 0			24 11 6
Dairy Attendants . . .	38 13 0			42 14 3
Milk and Cream . . .	78 17 2			52 9 3
Do. (1896) . . .	15 16 5			..
Coal, Salt, Ice, &c.	21 5 7			27 5 2
Carriage of Plant	15 16 3			19 17 6
Printing, Stationery, Postages and Telegrams	13 7 3			10 15 2
Prizes to Students	20 2 6			26 18 0
Repairing and replacing Plant and Fittings	7 18 1			29 6 0
		575 13 9		573 15 [illegible]
Carried forward . .	£	1,828 3 1	10,067 15 10	

DR.

CASH ACCOUNT—*continued.*

RECEIPTS.	1897. SOUTHAMPTON.		1 ST.
	£ s. d.	£ s. d.	£
Brought forward . . .	1,284 0 0	8,787 3 9	
SCHOOLS—*continued.*			
DORSET CHEESE :—			90
Sale of Plant	40 19 8		
		1,324 19 8	3,26
EXPERIMENTS :—			
FIELD :—			
Sale of Hay.	6 0 0		
FIELD, CHEESE, AND CIDER :—			
Government Grant	300 0 0		350
		306 0 0	350
Sale of India Stock (£1,847 4*s.* 7*d.*) . . .	..	2,000 0 0	1,967
		12,418 3 5	14,6[illegible]7
Balance in Bank, Jan. 1, 1897	..	420 12 11	..
		£ 12,838 16 4	14,6[illegible]7

CASH ACCOUNT—*continued*.

Cr.

PAYMENTS.		1897. Southampton.		1896. St. Albans.
		£ s. d.	£ s. d.	£ s. d.
Brought forward . . .		1,828 3 1	10,067 15 10	
SCHOOLS—*continued.*				
Dorset Cheese:—	£ s. d.			
Steward's Time and Expenses .	7 7 11			
Office Staff	3 7 6			
Repairing and replacing Plant .	53 17 10			
		64 13 3		841 12 9
Balance to County Council		40 12 11		
			1,933 9 3	2,991 7 10
XPERIMENTS:—				
Field:—				
Rent of Field	14 0 0			..
Manures, Seeds, and Cattle Food .	23 3 4			21 16 1
Printing and Stationery. . .	22 2 0			38 13 0
Stewards' Time, Travelling, Postage, &c.	34 0 1			39 6 3
Secretary and Office . . .	23 6 8			23 6 8
Consulting Chemist . . .	9 12 9			27 6 8
Do. Botanist . . .	..			14 12 6
Botanical Visitor	29 8 1			45 14 9
Veterinary Surgeon . . .	7 7 0			..
Bacteriologist	32 11 0			..
Expenses of Cattle and Loss on Sale	3 8 6			..
Labour and Occupier's Expenses .	14 18 6			..
		213 17 11		210 15 11
Cider:—				
Expert	80 0 0			75 0 0
Fittings	16 0 0			16 0 0
Office and Travelling . . .	9 6 8			10 2 2
Printing and Drawings . . .	26 13 6			18 2 9
		132 0 2		119 4 11
Cheese:—				
Expert and Assistant . . .	278 4 0			281 14 6
Board and Lodgings for Ditto and Carriage	19 6 0			13 7 6
Ditto Ditto (1896)	11 5 0			..
Printing and Publishing . .	34 19 5			31 11 9
Secretary and Office . . .	27 6 8			27 6 8
Fittings	..			2 16 5
		371 1 1		356 16 10
			716 19 2	686 17 8
			12,718 4 3	12,878 6 6
Balance due to Bank, Jan. 1, 1896 . .		..	..	338 4 6
Balance in Bank, Dec. 31, 1897 . . .		..	120 12 1	420 12 11
		£	12,838 16 4	14,637 3 11

ereby certify that I have examined the foregoing accounts for the year ending Dec. 31st, 1897,
red the payments entered with the vouchers, and found them all in order and correct.

n. 13*th*, 1898.

ALBERT GOODMAN, F.C.A.,
Auditor.

Passed by Council,
Jan. 25*th*, 1898.

THOS. F. PLOWMAN,
Secretary.

ASSETS AND LIABILITIES TO DECEMBER 31st, 1897, WITH COMPARISON FOR 1896.

ASSETS.	Par Value.	Actual Cost.	1897. Southampt'n.	1896. St. Albans.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
INVESTMENTS			16,987 4 7	18,542 12 2
New Zealand Stock	1,568 1 6	1,500 0 0		
Consols	3,001 4 0	3,209 19 6		
India Stock . . .	5,408 6 4	5,277 5 1		
Canada Stock . .	1,790 13 4	2,000 0 0		
Queensland Stock .	2,751 9 0	3,000 0 0		
N. S. Wales Stock	1,752 8 10	2,000 0 0		
	16,272 3 0	16,987 4 7		
PLANT (WORKS)		671 2 9		690 0 3
Do. (SCHOOLS)		36 19 2		46 3 11
			708 1 11	736 4 2
SUBSCRIPTION ARREARS			134 2 6	155 12 6
DIVIDENDS DUE			..	4 1 2
GOODS IN HAND (CHEESE)			75 0 0	..
DUE FROM COUNTY COUNCILS ON SCHOOLS ACCOUNTS			161 10 11	..
			18,065 19 11	19,438 10 0
Balance in Bank on Dec. 31, 1897 . . .			120 12 1	420 12 11
			18,186 12 0	19,859 2 11

LIABILITIES.	1897. Southampt'n.	1896. St. Albans.
	£ s. d.	£ s. d.
DEFERRED PRIZES	35 0 0	30 0 0
CARDIFF MEETING	800 0 0	800 0 0
JOURNAL, cost of forthcoming, estimated at . .	450 0 0	450 0 0
DUE TO COUNTY COUNCILS ON SCHOOLS ACCOUNTS	107 2 2	554 0 10
OTHER OUTSTANDING ACCOUNTS	18 7 5	29 12 7
	1,410 9 7	1,863 13 5
Balance	16,776 2 5	17,995 9 6
	18,186 12 0	19,859 2 11

Bath and West and Southern Counties Society,

FOR THE

Encouragement of Agriculture, Arts, Manufactures, and Commerce.

List of Members.

CORRECTED TO JANUARY 25TH, 1898, INCLUSIVE.

PATRON.

HIS ROYAL HIGHNESS THE PRINCE OF WALES, K.G.

PRESIDENT
FOR 1897–98.

THE RIGHT HON. THE LORD WINDSOR.

TRUSTEES.

RIGHT HON. SIR T. D. ACLAND, BART.
SIR J. F. LENNARD, BART.
RIGHT HON. SIR R. H. PAGET, BART.

Names thus (*) distinguished are Governors.
Names thus (†) distinguished are Life Members.
⁂ *Members are particularly requested to make the Secretary acquainted with any errors in the names or residences.*

Name.	Residence.	Subscriptions. £	s.	d.
†WALES, HIS ROYAL HIGHNESS THE PRINCE OF, K.G.	Sandringham, Norfolk		. .	
†York, H.R.H. The Duke of, K.G.	York Cottage, Sandringham		. .	
Abbot, G.	The Priory, Abbots Leigh, Bristol	1	0	0
†Ackers, B. St. John	Huntley Manor, Huntley, near Gloucester		. .	
Acland, Sir H. W., Bart., K.C.B., M.D., &c.	Broad Street, Oxford	1	0	0
*Acland, Right Hon. Sir T. Dyke, Bart.	Killerton, Exeter	5	0	0
Acland, Alfred Dyke	38, Pont Street, Belgrave Square, London, S.W.	1	0	0
*Acland, Charles T. D.	Holnicote, Taunton	2	0	0
†Acland, Rt. Hon. A. H. Dyke, M.P.	28, Cheyne Walk, London, S.W.		. .	
Adams, E. (10)	Horner Farm, West Luccombe, Minehead	0	10	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Adams, George	Royal Prize Farm, Pidnell, Faringdon, Berks	1	0	0
Adams, S. W., jun.	7, Boringdon Villas, Plympton St. Mary	1	1	0
*Addington, Lord	Addington House, Winslow, Bucks.	2	2	0
Affleck, F. and T.	Swindon	1	0	0
†Agate, Alfred	Broomhall, Horsham		. .	
Aiken, J. C.	The Glen, Stoke Bishop, Bristol.	1	0	0
†Aitken, G. H.	Warminster		. .	
Alexander, D. T.	Cardiff	1	1	0
†Allen, Col. R. E.	Assist. Adj.-Gen.; Curragh Camp, Kildare, Ireland		. .	
†Allen, James D.	Springfield House, Shepton Mallet		. .	
*Allen, J.	Park Place, Cardiff	2	0	0
Allen and Sons	Shepton Mallet	1	0	0
Allen, W. T.	West Bradley, Glastonbury	1	0	0
Allmand, F.	Victoria Flour Mills, Wrexham	1	0	0
*†Amherst, Earl	Montreal, Sevenoaks		. .	
Anglo-Bavarian Brewery Co.	Shepton Mallet	1	0	0
Anglo-Swiss Condensed Milk Co.	Chippenham	1	0	0
Archer, C.	Trelaske, near Launceston	1	0	0
†Arkwright, J. H.	Hampton Court, Leominster		. .	
Armstrong, J. D.	Vallis Farm, Frome	1	0	0
Ashburton, Lord	The Grange, Alresford, Hants	1	0	0
†Ashcombe, Lord	7, Prince's Gate, London, S.W.		. .	
Ashcroft, W.	13, The Waldrons, Croydon	1	0	0
Ashford, E. C., M.D.	The Moorlands, Bath	1	0	0
Aubrey, T., F.R.C.V.S.	19, Paragon, Bath	1	0	0
†Aveling, Thomas L.	Rochester		. .	
Avon Manure Co.	St. Philip's Marsh, Bristol	1	0	0
Awdry, P. D.	Chippenham	1	0	0
Ayshford-Wise, Major Lovat	Watts House, Bishop's Lydeard.	1	1	0
Baber, S.	Elborough Farm, Locking, Weston-super-Mare	1	0	0
Badcock, H. Jeffries	Taunton	1	0	0
Badcock, W. L.	Pitminster Lodge, Taunton	1	0	0
Bailey, H.	St. Stephens, St. Albans	1	0	0
Bailey, J.	Nynehead, Wellington, Somerset	1	0	0
†Baillie, Evan	Filleigh, Chudleigh		. .	
Bailwood, F. H. M.	Horsington, Wincanton	1	1	0
†Bainbridge, Captain J. H.	Gnaton Hall, Yealmpton, Plymouth		. .	
Baker, F.	Manor Farm, Frindsbury, Rochester	1	0	0
Baker, G. E. Lloyd	Hardwicke Court, nr. Gloucester.	1	0	0

Name.	Residence.	Sub-scriptions.		
		£	s.	d.
J.	Ottershaw Park, Chertsey, Surrey		. .	
obert N. G.	Heavitree, Exeter		. .	
H.	Mere Down, Mere	0	10	0
illiam	Eastbury, Epsom Road, Guildford	1	0	0
uel	Westacott Nursery, Barnstaple	1	0	0
aptain K. R.	Branksea Island, Poole	1	0	0
W. E.	Barvin, Potters Bar, Herts	2	0	0
H., and Sons	Uttoxeter	1	0	0
A. C.	Thirsk, Yorkshire	1	0	0
	Wolveton, Dorchester	1	0	0
F.	Horsted Place, near Uckfield	1	0	0
d Perkins.	Peterborough	1	0	0
G. T.	College Farm, Finchley	1	0	0
on. A. H.	The Grange, Alresford, Hants	1	0	0
A.	Solesbridge, Chorleywood, Herts	1	0	0
ajor William	Moredon, North Curry, Taunton	1	0	0
A.	Nailstone Stud, Nailstone, near Nuneaton	1	0	0
J. J.	The Lodge, Weston-super-Mare	1	1	0
ohn	Hackwood Farm, Basingstoke	1	0	0
Sir Walter, Bart.	Coates, Pulborough, Sussex	1	1	0
C. H.	Pilton House, Barnstaple		. .	
B. J. P.	Kitley, Yealmpton, Ivybridge	2	0	0
F. J.	The Reddings, Moor Green, Birmingham	1	0	0
arquess of	Longleat, Warminster		. .	
Wells, The Bishop of	The Palace, Wells	1	1	0
Co.	Bath	1	0	0
C., jun.	Lydney Park, Glos.	1	0	0
, Earl	Cirencester House, Cirencester	2	2	0
	Westown, Bristol	1	0	0
ol. Mount	Coker Court, Yeovil	1	0	0
oll, R. H.	Road Manor, Bath	1	0	0
l, W. J.	St. Loyes, Exeter		. .	
Edward	Broadway, Dorchester	1	0	0
e, F. H.	Hailwell Farm, Framfield, Sussex	1	0	0
H.	Gelderd Road, Leeds	1	0	0
R.	Torr Grove, Plymouth		. .	
p, E. B.	Trevince, Scorrier, Truro	1	0	0
M. H., M.P.	Coombe Priory, Shaftesbury	1	0	0
anford, J.	Pyt House, Tisbury	1	1	0
Jos.	Down House, Dursley, Glos.	1	0	0
Brothers	*Journal* Office, Salisbury	1	1	0
	Kingston Fields, Derby	1	0	0
Edward Hammond,			. .	
o.	Heybridge, Maldon, Essex	1	0	0
J. Herbert	Englefield House, Reading	5	0	0
	Milverton, Somerset	1	0	0
Lord	Uffington House, Stamford		. .	
H. W.	Roselands, Woolston, Southampton	1	0	0
R.	Abbot's Ann, Andover	1	0	0

Name.	Residence.	Sub-scriptions. £	s.	d.
*†Best, Capt. John C. (R.N.).	Plas-yn-Vivod, Llangollen . .	. .		
†Best, Col. George	Charlton House, Ludwell, Salisbury	. .		
Best, Major M. G.	Park House, Boxley, Maidstone.	1	0	0
Best, Captain T. G..	Dean House, Whitchurch, Hants	1	0	0
†Best, Lieut. W.	Vivod, Llangollen	. .		
Bevington, T.	The Grove, Witham.	1	1	0
Beviss, W. Salter	Linnington, Wambrook, Chard .	1	0	0
Bigg, Thomas	Leicester House, Great Dover Street, London, E.C..	0	10	0
Birmingham, C..	Holnicote, near Minehead . . .	0	10	0
Biscoe, H. S. T.	Holton Park, near Oxford . : .	1	0	0
Blackstone and Co. (Limited)	Rutland Iron Works, Stamford, Lincoln	1	1	0
Blake, Abel	Loxbeare, Tiverton	0	10	0
Blake, William	Bridge House, Ilminster, South Petherton	1	0	0
Blinman, H. T.	Parsonage Farm, Farrington Gurney, Bristol	0	10	0
Blosse, E. F. L.	Peterstone Super Ely, near Cardiff	1	0	0
Blundell, R. C.	Benhams, Horley, Surrey . . .	1	1	0
Blyth, Sir J., Bart..	Pantheon, Oxford Street, London	1	0	0
Board, J.	Hill Farm, East Pennard, Shepton Mallet	1	0	0
Boby, Robert.	Bury St. Edmunds, Suffolk . .	1	0	0
Bodman, G.	Park Farm, Yatton	1	0	0
Bolden, Rev. C.	Preston Bissett, Buckingham. .	1	0	0
Bolitho, T. B., M.P. . . .	Treridden, Penzance	1	0	0
†Bond, N.	Creech Grange, Wareham, Dorset	. .		
Boscawen, Rev. A. F. . . .	Ludgvan Rectory, Long Roch, Cornwall, R.S.O.	1	0	0
*Boteler, Capt. W. J. Casberd	The Elms, Taplow	2	0	0
†Boughton-Knight, A. R. . .	Downton Castle, Ludlow . . .	. .		
Bound, William	Hurstborne Tarrant, Andover. .	1	1	0
Bourne, C. H.	Stanmore Road, Edgbaston, Birmingham	1	1	0
Bouverie, Hon. D. P. . . .	Coleshill House, Highworth . .	1	1	0
Bouverie, H. P.	Brymore, Bridgwater	1	0	0
†Bowen-Jones, J.	Ensdon House, Montford Bridge.	. .		
*Bowerman, Alfred	Capton, Williton.	. .		
Bowerman, F.	Knott Oak House, Ilminster . .	1	0	0
Boyle, M.	Timsbury, Bath	1	0	0
Brophy, E. E.	Drungewick Manor House, Horsham, Sussex	1	0	0
Bradburne, H.	Lyburn, Lyndhurst, Hants . .	1	0	0
Bradford, Thos., and Co. . .	Salford, Manchester	1	0	0
Bradley, W. McK.	Leylands, Meopham, Kent . .	1	1	0
Braikenridge, John Herman.	The Rookery, Chew Magna, Bristol	. .		
Braikenridge, W. J. . . .	Newton House, Clevedon, Somerset	1	1	0
Brain, S. A.	Old Brewery, Cardiff	1	0	0
Brassey, A., M.P.	Heythrop, Chipping Norton, Oxon	. .		

Name.	Residence.	Subscriptions. £	s.	d.
H. L. C.	Preston Hall, Aylesford, Kent	. .		
G.	Broomhill, Stratton, North Devon	1	0	0
V., and Co.	Polbathic, St. Germans	1	0	0
agon Works Com- Limited)	Lawrence Hill, Bristol	1	1	0
dmiral R. F.	Kenwick, Worcester	1	0	0
l, T. Palfrey	Enmore Park, Bridgwater	1	0	0
d, W. B.	Enmore Park, Bridgwater	. .		
F. D.	Beach Borough, Hythe, Kent	1	0	0
E.	Cossington, Somerset	1	0	0
	Hill Farm Dairy, Southampton	1	1	0
	Marden Farm, Hertford	1	0	0
illiam Jeffery	Middlehill House, Box, Wilts	1	0	0
G. Prideaux	Prideaux Castle, Padstow	1	0	0
	7, Princes Street, Yeovil	1	0	0
P.	Bystock, near Exmouth	. .		
William E., M.P.	Ilsington House, Dorchester	. .		
	Worcester	1	0	0
am, Rev. F. F.	The Rectory, Doddiscombsleigh, Exeter	. .		
W. J.	Llanelly	1	0	0
B.	Holcombe Rogus, Wellington, Somerset	1	0	0
C.	Land Surveyor, Shepton Mallet	1	0	0
dmiral A.	Erle Hall, Plympton	. .		
, E. A.	Coombe Florey, Taunton	1	0	0
W.	Chippenham	1	0	0
e, Lord.	Debden Hall, Saffron Walden.	1	0	0
R.	Cattedown, Plymouth	1	0	0
	Island House, Highbridge	1	0	0
, and Sons	St. Nicholas Works, Thetford	1	0	0
Sir C. R., Bart.	Knepp Castle, Sussex	. .		
L. E.	Ellaston, Atlantic Road South, Weston-super-Mare	1	1	0
	Elphicks, Horsmonden, Kent.	1	0	0
and W.	Torquay	1	0	0
., and Co.	Bath	1	0	0
th, R. W.	Percy House, Kensington, Bath	1	0	0
ol. A. M.	Ockley Court, Dorking	1	0	0
C. Lee	Glewstone Court, Ross	1	0	0
W. H.	Danney, Hassocks, Sussex.	1	0	0
C.	Woolcombe, Cattistock, Dorset	1	0	0
	Milton Clevedon, Evercreech	1	0	0

Name.	Residence.	Subscriptions. £	s.	d.
Carew, C.	Collipriest, Tiverton	1	0	0
†Carey, P. W.	Cardiff		. .	
Carnarvon, Earl of	Highclere Castle, Newbury	1	1	0
Carr, L.	Court-y-bel, Penarth, Glam.	1	0	0
†Carter, E.	Puckpool House, Ryde, Isle of Wight		. .	
Carter, J., and Co.	238, High Holborn, London	1	0	0
†Cartwright, F. F.	7, Percival Road, Clifton		. .	
Carver, H. R.	West House, Chilton Polden, Bridgwater	1	0	0
Cary, Edmund	Pylle, Shepton Mallet	0	10	0
†Cary, W. H.	Steeple Ashton, Trowbridge		. .	
Cater, R. B.	Bath	1	1	0
Cathedral Dairy Co.	Exeter	1	1	0
†Catt, C. W.	52, Middle Street, Brighton (Hon. Local Sec., 1885)		. .	
*Cawdor, Earl of	Stackpole Court, Pembroke	2	0	0
Cecil, Lord A.	Orchardmains, Tunbridge	1	0	0
Cecil, Lord L.	Orchardmains, Tunbridge	1	0	0
Chadwyck-Healey, C. E. H.	New Place, Porlock, Somerset	1	0	0
*Chaloner, Capt. R. G. W., M.P.	Melksham House, Melksham, Wilts	2	0	0
Champion, F.	West Pennard, Glastonbury	1	0	0
†Chapman, C.	Carlecotes Hall, Dunford Bridge, near Sheffield		. .	
Chapman, Rev. H.	Donhead St. Andrew, Salisbury	1	0	0
Chapman, W. W.	Fitzalen House, Arundel Street, Strand, London	1	0	0
Cheetham, F. H.	Tetton House, Kingston, Taunton	1	1	0
Chick, John	Compton Valence, Dorchester	1	1	0
Chorley, W. L.	Quarme, Dunster, Somerset	1	0	0
Churchouse, A.	Perridge House, near Shepton Mallet	1	0	0
*Clarendon, Earl of	The Grove, Watford	2	2	0
Clark, Isaac	West Lynch, Selworthy	1	0	0
Clark, James	Street, Glastonbury	1	0	0
†Clark, J. J.	Goldstone Farm, West Brighton (Hon. Local Sec., 1885)		. .	
Clark, W. S.	Street, Glastonbury	1	0	0
Clarke, A. J.	100, New Bond Street, London	1	1	0
Clarke, Captain J. S.	Langley Lodge, Chippenham	1	0	0
Clarke, James	. . .	0	10	6
Clarke, Joshua	Minehead	1	0	0
†Clarke, Capt. T. E.	Alcombe, Cote, Dunster		. .	
Clarke, W.	East Lynch, near Minehead, Somerset	1	0	0
Clarke, W. Hurle	Manor Cottage, Wanstrow, Somerset	1	1	0
Clayden, H.	Northoe, Park View, Hoddesdon	1	1	0
*Clayton, Shuttleworth, and Co.	Lincoln	2	2	0
Cleall, S.	Berwick, Bridport	1	0	0
Cleave, B. C.	Sanctuary, Crediton, Devon	1	1	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Cleave, W. C.	Sanctuary, Crediton, Devon . .	1	1	0
Cleaver, Capt. J. H. . . .	Cannon Street Hotel, London, E.C.	1	0	0
Clerk, Edmund H.	Burford, Shepton Mallet . . .	1	0	0
Clerk, Lt.-Col. R. M. . . .	Charlton House, Shepton Mallet.	1	0	0
†Clifford, Lord	Ugbrook, Chudleigh		. .	
*Clinton, Lord	Heanton Satchville, Beaford, North Devon	2	2	0
Clout, R.	Brome House, West Malling, Kent	1	0	0
Clutton, Robert Geo. . . .	9, Whitehall Place, London . .	0	10	0
Clutton, R. W.	Doner's Lodge, Reigate	1	0	0
Coates, S. B.	Stanton Drew Court, Pensford .	1	0	0
Cobb, H. M.	Higham, Kent	1	0	0
Cockey and Sons	Frome Selwood	0	10	0
Coles, C.	Manor House, Winterbourne Stoke, Salisbury	1	0	0
Colfox, W.	Westmead, Bridport	1	0	0
Collingbourne, J. S. . . .	Aston Ingham, near Ross . . .	1	0	0
Collins, C.	Longhouse Farm, Oldford, Frome	1	0	0
Collins, C. R.	Hartwell House, Exeter . . .	1	1	0
Collins, D.	Newton Ferrars, Carrington, Cornwall	1	0	0
Colman, J. J., M.P. . . .	Carrow House, Norwich . . .	1	1	0
*Colston, E., M.P.	Roundway Park, Devizes . . .	2	2	0
Colthurst, Symons, and Co. (Limited)	Bridgwater	1	0	0
*Combe, R. H.	Pierrepont, Farnham	2	0	0
*Combe, R. T.	Earnshill, Curry Rivell, Taunton	2	2	0
Coney, Herbert F.	The Poplars, Pucklechurch, Bristol	1	0	0
Cook, N.	Chevithorne Barton, Tiverton .	1	1	0
Cooke, C. W. Radcliffe, M.P.	Helens, Herefordshire, *viâ* Dymock, Glos..	1	0	0
†Cookson, H. T.	Sturford Mead, Warminster . .		. .	
Cooling, G., and Son . . .	Northgate Street, Bath . . .	1	1	0
Coombs, Joseph	Radstock, Bath	1	0	0
Cooper, G. H.	Huntspill, Bridgwater	1	1	0
†Cooper, P. W. D.	99, Pembroke Road, Clifton . .		. .	
†Cooper, R. P.	Shenstone Court, Lichfield . .		. .	
Corbett, J. R.	More Place, Betchworth, Surrey.	1	0	0
Corbett, Thomas.	Perseverance Iron Works, Shrewsbury	1	0	0
*Cork and Orrery, The Earl of	Marston, near Frome	2	2	0
†Corner, H. W.	Manor House, Inglescombe, Bath		. .	
†Cornwallis, F. S. W. . . .	Linton Park, Maidstone . . .		. .	
Cory, C. J.	Llantarnum Abbey, Mon. . .	1	0	0
*Cory, H. B.	Druidstone, Castleton, Cardiff .	2	0	0
Cory, R.	3, Elliott Terrace, Plymouth . .	1	0	0
Cotton, Col., the Hon. R. S. .	Somerford Hall, Brewood, Staffs.	1	0	0
Coultas, J. P.	Perseverance Works, Grantham .	1	0	0
Counsell, J. E.	Wedmore, Weston-super-Mare .	1	0	0
Courtenay, Hon. H. L. . .	Fox, Fowler's Bank, Exeter . .	1	0	0
†Coussmaker, Lieut.-Col. G. .	Westwood, Guildford, Surrey .		. .	

Name.	Residence.	Sub-scriptions.		
		£	s.	d.
*Coventry, The Earl of	Croome Court, Severn Stoke, Worcestershire	2	2	0
Cowles, W. J.	Barnet, Herts	1	0	0
Cox, B.	Pwlpen Farm, Christchurch, Newport, Mon.	0	10	0
Cox, C.	Pendennis, Landguard Road, Southampton	1	0	0
Cox, James	Rosewell Farm, High Littleton, Bristol	1	0	0
Craig, W.	Winford Tower, Beaworthy, R.S.O., Devon		10	0
Crawshay, W. T.	Caversham Park, Reading	1	0	0
Crick, Thomas	Great Ash, Winsford, Dulverton	0	10	0
Crocker, F. W.	Tedford Farm, Batcombe, Cattistock, Dorset	1	0	0
Crookshank, Prof. E. M.	King's College, London	1	0	0
Crowley, J., and Co. (Ld.)	Meadow Hall Works, Sheffield	1	0	0
Crutchley, P. E.	Limminghill Lodge, Ascot	1	0	0
Culverwell, E. T.	Durleigh Farm, Bridgwater	1	0	0
Cuming, A. P.	Moreton Hampstead, Devon	1	0	0
Cundall, H. M., F.S.A.	Richmond, Surrey	1	0	0
Custance, Mrs. M.	Woodlands, Southwater, Horsham	1	0	0
Cutcliffe, G.	Coombe House, Witheridge, N. Devon	1	1	0
Dairy Outfit Company (Ld.)	King's Cross, London	1	0	0
Dairy Supply Company (Ld.)	Museum St., Bloomsbury, London	1	0	0
Damerel and Son	161, Sidwell St., Exeter	1	0	0
Dames, C. R.	Hill Stud Farm, Winchester	1	0	0
Dampney, G. D	Hinton, Ilchester	1	0	0
Danger, Thomas	Rowford Lodge, Taunton	1	0	0
Daniel, Rev. [illegible]	Manor House, Stockland, Bridgwater	1	0	0
[illegible]	Manor House, Stockland, Bridgwater		..	
[illegible]aule, F. [illegible]	Stoodleigh, Tiverton	1	1	0
Darby, A. [illegible]	Little Ness, Shrewsbury	1	0	0
Darby, E [illegible]	Liscombe, Dulverton	1	0	0
Darby, S [illegible]	Merafield, Martock, R.S.O.	1	0	0
Davenport, Rev. George	Foxley, Hereford		..	
Davey, J. Sydney	Brockym House, Helston, Cornwall		..	
Davey, Sleep and Co.	Excelsior Plough Works, Plymouth	1	0	0

Name.	Residence.	Sub-scriptions.		
		£	*s.*	*d.*
T.	Beere Manor, Cannington, Bridgwater	1	0	0
J. N.	Gweleath, Cury, R.S.O., Cornwall	1	0	0
F. L.	7, Bute Crescent, Cardiff	1	1	0
H. J.	Tivoli, Newport, Mon.	1	0	0
. J.	Doulting, near Shepton Mallet	1	0	0
W.	Tracy Park, Bristol		. .	
	Larkbere Farm, Ottery St. Mary, Devon	1	0	0
R. R. M.	Spurbarne, Exeter	1	0	0
, Hon. R.	Holne Park, Ashburton.	1	0	0
, W. and F.	Market Place, Bath.	1	1	0
d Sons	Crewe	1	0	0
hn.	Huxham, E. Pennard, Shepton Mallet	1	0	0
on, and Hewitt	22, Dorset St., Baker St., London		. .	
, W. A.	20, Birchin Lane, London, E.C.		. .	
	Newport, Mon.	1	0	0
uiere, Lord	Woodborough House, Bath	1	0	0
ke, Lord Willoughby	Compton Verney, Warwick		. .	
o, Col.	Brook Lodge, Holm Wood, Dorking, Surrey	1	0	0
, Rev. A. F.	Meshaw Rectory, S. Molton	1	0	0
nay, A.	Col d'Arbres, Wallingford	1	0	0
rrieta, A.	Wadhurst Park, Hawkhurst, Sussex		. .	
R.	Bishop's Sutton, Bristol	1	1	0
Rev. Samuel	Lattiford House, Wincanton	1	0	0
C., and Co.	Chard, Somerset	1	0	0
The Earl of	Knowsley, Prescot		. .	
re, H. Denis	Charlton House, Wantage		. .	
shire, Duke of, K.G.	Chatsworth, Derbyshire	5	0	0
's, Limited	Chester	1	1	0
Lord	Minterne, Cerne Abbas		. .	
J. K.	Sherborne Castle, Sherborne	1	0	0
J. K. W., M.P.	Sherborne Castle, Sherborne	1	0	0
. D., jun.	Manor Farm, Bathford, Bath.	1	0	0
, W. V.	Perridge House, Shepton Mallet.	1	0	0
on, R. M.	Horsington House, Templecombe	1	1	0
well, A. C.	Ripple Hall, Tewkesbury	1	0	0
C.	Elm Grove, Dawlish	1	0	0
James	Melrose, Glastonbury	1	0	0
A. F. Milton	Bladon, Woodstock		. .	
Earl of	Tortworth Court, Falfield, R.S.O., Glos.	2	0	0
m, T.	2, Clarence Villas, Ryeland Street, Hereford		. .	
orth, Rev. W. A.	Orchardleigh Park, Frome.	2	0	0
rth-King, Sir D., Bart.	Wear House, near Exeter	1	0	0
, Major A. G.	Stock House, Sturminster Newton	1	0	0
ne, Lord	Greendale, Clyst St. Mary, Exeter		. .	
van, Viscount	40, Charles Street, London, W.		. .	

Name.	Residence.	Subscriptions.		
		£	s.	d.
Dunn, William	Frome	1	1	0
*Dunraven, Earl of	27, Norfolk Street, Park Lane, London, W.	2	2	0
†Durrant, Edward	Tunbridge Wells (Hon. Local Sec. 1881)		. .	
Dyke, Thomas	Long Ashton Lodge, Clifton, near Bristol	1	0	0
*Dyke, Rt. Hon. Sir W. Hart, Bart., M.P.	Lullingstone Castle, Eynsford	2	2	0
†Dymond, Edward E.	Oaklands, Aspley Green, Bletchley		. .	
Dymond, Francis W.	Bampfylde House, Exeter	1	0	0
Eagle Range and Foundry Co. (Limited)	Catherine Street, Aston, Birmingham	1	0	0
Easton and Bessemer (Ld.)	Taunton	1	0	0
Easton, Richard	Heale Mount, Taunton	1	0	0
Eddy, J.	Kennford Ironworks, Exeter	1	0	0
Edgar, Frank	Polden Hill Dairy, Chilton Polden, Bridgwater	1	0	0
†Edgcumbe, Sir E. Robt. P.	Somerleigh Court, Dorchester		. .	
Edgington, Benjamin (Limited)	2, Duke Street, London Bridge, S.E.	1	0	0
†Edmondson, A.	Tubney Warren Farm, Abingdon		. .	
Edwards, C. L. Fry	The Court, Axbridge, Somerset	1	0	0
Edwards, A. P.	Hutton, Weston-super-Mare	1	0	0
Edwards, Jas.	Belmont, Flax Bourton, near Bristol	1	0	0
Edwards, Jas.	Brynhyfryd, Bwlch, Breconshire	1	0	0
Edwards, W. H. [illegible]	Butcombe Court, Wrington	1	0	0
Egmont, Ear[illegible]	Cowdray Park, Midhurst, Sussex		. .	
Eldridge, Po[illegible] and [illegible]	Dorchester	1	0	0
Elliot, H. F. [illegible]	Leigham House, Plympton	2	2	0
Ellis, J.	Summersbury Hall, Shalford, near Guildford	1	0	0
[illegible]	Maidstone	1	0	0
[illegible]	Firwood, Clevedon	2	2	0
Elworth[illegible]	Stone Farm, South Molton	0	10	0
Enys, [illegible]	Enys, Penryn, Cornwall	1	0	0
Esdaile, C. E.	Cothelstone House, Taunton	1	0	0
Evans, Daniel	Winsford, Dulverton	0	10	0
[illegible] (3)	Ewell Grove, Surrey		. .	

Name.	Residence.	Sub-scriptions. £	s.	d.
. J.	Greenhill, Whitchurch, Cardiff	1	0	0
H.	Ford Abbey, Chard	1	0	0
homas, Commander A.	Cae Rwnon, Builth		. .	
M.	Woodram Farm, Pitminster, Taunton	1	0	0
S. W.	Little Bedwin, Wilts		. .	
Capt. W.	The Priory, Burnham, Bucks.	1	0	0
, F. Geo.	Laura Place, Bath		. .	
	Ludlow Estate Offices, Downton Castle, Bromfield, Salop	1	0	0
	Milton Manor, Pewsey, Wilts	1	0	0
. P.	Little Barwick, Yeovil	1	0	0
t. W.	Langton Hall, Northallerton, Yorks.	1	1	0
	Elham, Canterbury	1	0	0
.	St. Martins House, Wareham.	1	0	0
. P.	The Briars, Alphington, Exeter	1	1	0
lexander	Little Brickhill, Bletchley, Bucks	1	0	0
W.	Westwood Court, Faversham.	1	0	0
rge J.	Churston Court, near Brixham, Devon	1	0	0
	Mendip Lodge, Langford, Somerset	1	0	0
C. E.	Kenward, Yalding, Maidstone	1	0	0
, Lionel J. W.	Ewell Manor, West Farleigh, Maidstone		. .	
W. J.	The Chantry, Wimborne	1	0	0
ames	Chilmark, Salisbury	1	0	0
. F.	The Hill, Stratford-on-Avon	1	0	0
ev. Canon	Worth Vicarage, Dover	1	1	0
V. R.	West Stafford, Dorchester	1	1	0
nd Bate (Limited)	Gorton, Manchester	1	0	0
	Wraxall Court, Nailsea, near Bristol	1	0	0
r, Capt. F. W.	Cresswell, Morpeth		. .	
.	St. Fagans, Cardiff	1	0	0
. C.	Clatford Mills, Andover	1	0	0
V. S.	Gore Court, Maidstone	1	0	0
e, Earl	Castle Hill, South Molton	2	0	0
rter, G. L.	Puckrup Hall, Tewkesbury	1	0	0
. L.	Wells, Somerset	1	1	0
os.	The Oil Mills, Gloucester	1	1	0
.	Ripple Vale, Deal, Kent	1	1	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Fowler and De la Perrelle	Gloucester Square, Southampton	1	0	0
†Fowler, G.	Claremont, Taunton	.	.	
Fowler, J., and Co. (Limited)	Leeds	1	0	0
Fowler, Richard	Broughton, Aylesbury	1	0	0
Fowler, W. H.	Claremont, Taunton	1	0	0
Fox Brothers and Co.	Wellington, Somerset	1	0	0
Fox, C. L.	Shute Lodge, Wellington, Somerset	1	0	0
Fox, Dr. A. E. W.	16, Gay Street, Bath	1	1	0
†Fox, Robert	Falmouth	.	.	
Foxcroft, C. T.	Hinton Charterhouse, Bath	1	1	0
Foxcroft, E. T. D.	Hinton Charterhouse, Bath	1	1	0
†Franklen, Col. C. R.	Clemenstone, Bridgend	.	.	
Franklin, J. N.	Bussell's Farm, Huxham, Exeter	1	0	0
Fricker, J. A.	Burton, Mere, Wilts.	1	0	0
Froom, Robert	Yondercott Farm, Uffculme, Devon	0	10	0
Frost, Adam E.	Ottery Villa, Pentonville, Newport, Mon.	1	0	0
Fry, H. A.	19, Monmouth Place, Bath	1	0	0
Fry, W.	Curry Rivell, Taunton	1	0	0
†Fryer, William Rolles	Verwood Manor, Salisbury	.	.	
Fuller, E. R.	Bathford, Bath	1	1	0
†Fuller, G. Pargiter.	Neston Park, Corsham	.	.	
*Fuller, J. M.	Neston Park, Corsham	2	0	0
Fuller, S. and A.	Bath	1	0	0
Fursdon, Charles	Fursdon, Tiverton, Devon	1	0	0
Fursdon, E. S.	Posbury House, Crediton	1	1	0
†Galloway, W. G.	Cridland Farm, Spaxton, Bridgwater	.	.	
Gardiner, Sons, and Co.	Nelson Street, Bristol	1	1	0
Gardner, W.	Chippenham	1	0	0
Gardner, W. E.	Bedminster, Bristol	1	1	0
Garratt, Lt.-Col. T. A. T.	Bishop's Court, Exeter	2	2	0
arth, T. C.	Haines Hill, Twyford	0	10	0
Garton, J. W.	Langhorne, Shepton Mallet	1	1	0
Garton, W.	Roselands, Woolston, Southampton	1	1	0
ar, W. H.	Union Street, Bath	1	1	0
Gee, B. G. H.	Lock's Mill House, near Bristol	1	0	0
George, F. B.	Swan Hotel, Wells, Somerset.	1	0	0
†George, William E.	Howe Croft, Stoke Bishop, Bristol	.	.	
rrish, J.	Chipping Sodbury	1	0	0

Name.	Residence.	Sub-scriptions.		
		£	s.	d.
B. G.	Tunley Farm, Bath		. .	
George	Tunley, near Bath	1	0	0
Antony	Tyntesfield, Bristol		. .	
J.	Milford, Salisbury	2	2	0
. M.	Barrow Court, Flax Bourton, R.S.O., Somerset		. .	
enston	Metchley, Barlow's Road, Edgbaston, Birmingham	1	1	0
, T.	Havyet Lodge, Langford, R.S.O., Somerset	1	0	0
r W., Bart.	Cambridge House, Regent's Park, London	1	1	0
D. A., B.Sc.	University Extension College, Reading	1	0	0
illing, Capt. T.	Manor House, Bathford, near Bath	1	0	0
e, J.	Bowden Park, Chippenham		. .	
., & Sons (Limited).	Warwick	1	0	0
r Richard G., Bart.	Gaunt's House, Wimborne	2	2	0
. A.	Seagrove, Sea View, Isle of Wight	1	0	0
A. L.	The Lawn, Swindon	1	0	0
H.	Bossington, Allerford, Taunton	1	0	0
, C. B.	Woldringfold, Horsham.		. .	
J.	Park Hatch, Godalming	1	1	0
F. B.	Langley Burrell, Chippenham	1	1	0
, G. Prior	Derriads, Chippenham		. .	
Sir G., Bart	Beechfield, Corsham	1	0	0
J. R. P.	Compton House, Sherborne	1	0	0
A. J.	Chilton Cantelo, Ilchester	1	0	0
Rev. M. C.	Chilton Cantelo Rectory, Yeovil.	1	0	0
, A.	3, Hammet Street, Taunton	1	0	0
'anmure	Hatton Court, Threadneedle St., London	1	0	0
gton, W. F.	2, Princes Gate, London, W.	1	0	0
	Wiston Park, Steyning	1	0	0
Rev. John	Wiston Park, Steyning	2	2	0
, Hugh	Kingston-by-Sea, Brighton		. .	
Right Hon. G. J.,	69, Portland Place, London, W.	1	0	0
E.	Bursar, King's College, Cambridge	1	0	0
. J.	Bassaleg, Newport, Mon.	1	0	0
rs.	28, Broadwater Down, Tunbridge Wells.	2	2	0
, S. W.	Backwell Hill House, Backwell, Bristol	1	0	0
L.	Abergwynant Hall, Dolgelly, N. Wales		. .	
	The Whittern, Kington, Herefordshire	1	0	0
, Sir G., Bart.	Walton Hall, Warrington		. .	

Name.	Residence.	Subscriptions.		
		£	s.	d.
Greenaway, J.	Ebbw Place, Ebbw Bridge, near Newport, Mon.	1	0	0
Greenfield, W. B.	Haynes Park, Bedford	1	1	0
Greenham, W. N.	Overton, West Monkton, Taunton	1	1	0
Greenslade, W. R. J.	Bell House, Trull, Taunton	1	0	0
Gregory and Wrenn	Taunton	1	0	0
Gregory, Walter	Wellington, Somerset	1	0	0
Griffin, B.	New House, Broad Clyst, Exeter	1	0	0
Griffith, Col. J. T.	Fairfield House, Cheltenham	1	0	0
Griffiths, Bros.	West Place Hall, Coity, Bridgend	1	0	0
Grimstone, Commander Hon. W., R.N.	Sopwell, St. Albans	1	1	0
*†Guest, Merthyr	Inwood, Henstridge, Blandford	..		
Guille, H. G. de C. Stevens	Little Torrington, Devon	1	0	0
Guise, Sir W. F., Bart.	Elmore Court, Gloucester	1	0	0
Gulley, H. J.	Rodber House, Wincanton	1	0	0
*Gunn, J. E.	Tredelerck, Cardiff	2	0	0
Guyon, Rev. H. C.	The Rectory, Lamyat, Bath	1	0	0
†Hall, J. F.	Sharcombe, Wells, Somerset	..		
Hall, T. Farmer	39, Gloucester Square, Hyde Park, London, W.	1	0	0
Halsey, E. J.	104, Drayton Gardens, London, S.W.	1	0	0
Ham, J., jun.	Broadclyst, Exeter	0	10	0
Ham, William	Worridge, Collumpton	0	10	0
†Hambro, Everard A.	Hayes Place, Beckenham, Kent	..		
Hamilton, Hon. Mrs. A. B.	Sheldons, Hook, Hants	1	0	0
Hammett, F. T.	Hollins House, Chepstow Road, Newport, Mon.	1	0	0
Hancock, C.	The Grey House, Pucklechurch, Bristol	1	1	0
Hancock, Rev. F.	Selworthy, Somerset	1	0	0
Hancock, G. D.	Elm Hill, Grimley, Worcester	1	0	0
Hancock, H. C.	Halse, Taunton	1	0	0
*Handley, Rev. E.	Bath	2	0	0
Hankey, Col. W. A.	Beaulieu, St. Leonards-on-Sea	1	1	0
Hansard, H. W. and J.	Swansea	1	1	0
Harbord, Rev. H.	East Hoathley Rectory, Hawkhurst, Sussex	1	0	0
Harbottle, E.	Topsham	1	0	0
Hardeman, H.	Swan Hotel, Tenbury	1	0	0
Harding, T. K.	Ashton Gifford House, Codford, Bath	1	0	0
Harding, R.	Fenswood Farm, Long Ashton, Bristol	1	0	0
Harding, Webber	Highercombe, Dulverton	1	0	0
Hardinge, Viscount	South Park, Penshurst	1	1	0

Name.	Residence.	Sub-scriptions.		
		£	s.	d.
rd, W. H.	Old Bank, Bristol	1	0	0
r, J., and Son.	Ebley, Stroud	1	0	0
s, A.	Brownsell Farm, Stourton Caundle, Stalbridge	1	0	0
son, G.	Underpark, Lealholm, Grosmont, Yorks	1	0	0
son, Major-Gen.	West Hay, Wrington, R.S.O., Somerset.	1	0	0
son, McGregor, and Co.	Leigh, Lancashire.	1	0	0
d, C. D.	Manor House, Morebath, Devon	1	0	0
ey, W. M.	Allington Manor Farm, Bishopstoke	1	0	0
kes, T.	Williton, Taunton	1	0	0
kins, J. Heywood	Bignor Park, Petworth		. .	
kins, Rev. J. B. H.	Rectory, Chelwood, Bristol.	1	0	0
don, Lieut.-Col. W. H.	Malmesbury, Wilts		. .	
s, F. J.	West Pennard, Glastonbury	1	0	0
er, Rt. Hon. Sir A., Bart.	Trevina, Tintagel, Cornwall	1	0	0
er-Hames, C. G.	Chagford, Newton Abbott	1	0	0
l, J.	Dorchester, Dorset	1	0	0
l, H.	Shepton Mallet	1	0	0
thcoat-Amory, Sir J. H., art.	Tiverton, Devon	2	2	0
hcoat-Amory, I. M.	Hensleigh, Tiverton, Devon	1	0	0
ey, E. H.	Mitcham, Pontardawe	1	1	0
ar, Major G.	Poundisford, Taunton	1	0	0
nderson, W.	Berkley House, Frome		. .	
y, Lt.-Col. F.	Elmstree, Tetbury	1	0	0
on, F. R.	Morebath, North Devon	1	0	0
e, F. W.	Yeomans, Wrington, East Somerset	1	0	0
esbury, Lord	Heytesbury, Wilts	1	0	0
, B. H.	Belluton House, Pensford, Bristol		. .	
, Charles	Clevedon, Somerset		. .	
, Col. E. S., C.B.	Rookwood, Llandaff		. .	
Edmond	Stratton House, Evercreech, Bath	1	0	0
Sidney	Langford House, Langford, R.S.O.	1	1	0
W.	Kilkenny, Shepton Mallet	1	0	0
nan, J.	3, Gracechurch St., London, E.C.	1	0	0
isley, Edwin	Wells, Somerset	1	0	0
pisley, J. H.	Ston Easton, Old Down, Bath		. .	
isley, R. J. B.	Ston Easton Park, Bath	1	0	0
ock, A., jun.	Manor Farm, Motcombe, Shaftesbury, Dorset	1	0	0
ock, E.	Ashley Farm, Marnhull, Dorset	1	0	0
are, C.	37, Fleet Street, London	2	0	0
are, Sir H. H. A., Bart.	Stourhead, Bruton		. .	
are, W.	Staplehurst	2	0	0
os, J. T.	Maisey Hampton, Fairford	1	0	0
house, H., M.P.	Hadspen House, Castle Cary	2	0	0
linott, S.	Worminster Farm, Shepton Mallet	1	0	0

Name.	Residence.	Subscription £	s.
*†Hodgson, J. Stewart	Lythe Hill, Haslemere, Surrey	..	
Holland and Coombs	Bristol	1	0
Hollond, J. R.	Wonham, Bampton, Devon	1	0
Holt, W. D.	Manor Farm, Castle Cary, Somerset	1	0
Holt Needham, O. N.	Castle Cary, Somerset	1	0
Hood, Sir A. Acland, Bart., M.P.	St. Audries, Bridgwater	1	1
†Hooper, R. N.	Stanshawes Court, Chipping Sodbury	..	
Hopper, H. R.	48, Catford Hill, London, S.E.	1	1
†Horner, J. F. Fortescue	1, Whitehall Place, London, S.W.	..	
Hornsby and Sons (Limited)	Grantham, Lincoln	1	0
Horton, J.	Rabson Farm, Winterbourne Bassett, Swindon	1	0
Horton, Rev. Le G.	Wellow Vicarage, Bath.	1	1
Horwood, R. E.	Drayton Beauchamp, Tring, Herts	1	0
Hosegood, Obed., jun.	Dillington, Ilminster	0	10
Hosken, W. J.	Pulsack, Hayle, Cornwall	1	0
Hoskins, Robert.	Beard Hill, Shepton Mallet	1	0
How, J. H.	Bideford	1	0
Howard, E. S.	Thornbury Castle, Glos.	1	0
Howard, J. H.	Goldenhayes, Bartley, Totton, Hants	1	0
Howard, J. and F.	Britannia Works, Bedford.	1	0
Howse, H. J.	London, Gloucester, and N. Hants Dairy Co., Bristol	1	0
Hubbard, W. E.	Leonards Lee, Horsham	1	0
†Hughes, A. E.	Wintercott, Leominster	..	
Hulbert, T. R.	North Cerney, Cirencester	1	0
†Hulse, Sir Edward, Bart.	Breamore, Salisbury	..	
Hunter, J.	Seed Merchant, Chester	1	0
Huntley, W. V.	Welsh St. Donatts, Cardiff	1	0
†Hurle, J. Cooke	Southfield House, Brislington, Bristol	..	
Hurman, J.	12, Park Place, Cardiff	1	0
Hurst and Son	152, Houndsditch, London	1	0
Hussey, F. T.	The Grove, Cheddon Fitzpaine, Taunton	1	0
Hussey, John Richards	Beechcroft, St. Davids, Exeter	0	10
Huth, L.	Possingworth Manor, Waldron, Sussex	1	0
Hylton, Lord	Charlton, near Radstock	2	2

Name.	Residence.	Sub-scriptions. £	s.	d.
otson, R.	The Hawthorns, Knowle, Warwickshire	1	0	0
lchester, Earl of	Melbury, Dorchester		. .	
bert-Terry, H. M.	Strete Raleigh, Whimple	1	0	0
gram, Lieut.-Col. R. B.	Steyning, Sussex	1	1	0
es, J.	Merton, Surrey	1	0	0
kip, Jas.	Clifton Park, Bristol	1	1	0
y, Hon. C.	Hitcham Grange, Taplow	1	0	0
land, J. C. C	Brislington Hall, near Bristol	1	1	0
kson, Sir H. M., Bart.	Llantillio Court, Abergavenny	1	0	0
kson, W.	Manor House, Dawlish, Devon	1	0	0
obs, G. J.	Lansdowne, Guildford	1	0	0
nes, A. B.	Shovell Hill House, N. Petherton, Bridgwater	1	0	0
man, E. J.	Snowdon Villa, Chard	1	0	0
kin, S. W.	Liskeard, Cornwall	0	10	0
kins, Sir J. J.	The Grange, Swansea	1	0	0
kins, T.	Pantscallog, Dowlais	1	0	0
kins, W. H. P.	Baglan House, Briton Ferry, S. Wales	1	0	0
rsey, Earl of	Middleton Park, Bicester, Oxon	2	0	0
vel, W.	Thurliteer, Launcelles, near Cornwall	1	0	0
es' Sanitary Compounds Company	Cannon Street, London, E.C.	1	0	0
l, J.	The Firs, Shootup Hill, Brondesbury, N.W.	1	0	0
n, T. D.	Chaldeans Stud Farm, St. Fagans, Cardiff	1	0	0
ns, E.	Cowbridge, Glamorgan	1	0	0
nstone, R.	River View, Cardiff	1	0	0
lliffe, Hon. G., M.P.	Amerdown Park, Radstock		. .	
nas, F. N.	Crishall Grange, Saffron-Walden		. .	
nas, George	Ickleton, Saffron-Walden		. .	
nes, Henry Parr	Beaufort House, Winchester		. .	
es, Major F. J.	Chippenham	1	0	0
es, W. L.	Energlyn, Cathedral Road, Cardiff	1	0	0
ne, James B., and Co.	*Journal* Office, Bath	1	0	0
evil, J. V.	Shaw Farm, Melksham	1	0	0
ll and Co.	Gloucester	1	0	0
ler, F.	Sarisbury Green, Southampton	1	1	0
nble, C. A.	Timsbury, Bath	1	0	0
mp, L. J.	Maer Farm, Exmouth		. .	
nys-Tynte, St. David M.	Goathurst, Bridgwater	1	0	0
naway, Sir J. H., Bart., .P.	Escot, Ottery St. Mary	1	1	0

Name.	Residence.	Sub-scriptions	
		£	s.
Kennedy, D.	The Forbury, Reading	1	0
†Kettlewell, W. W.	East Harptree Court, Bristol		. .
*Keyser, C. E.	Aldermaston Court, Reading	2	0
Keyworth, J. & H., and Co.	35, Tarleton Street, Liverpool	1	0
Kidner, E.	Cothelstone Manor, Taunton	1	0
Kidner, John	Nynehead, near Wellington, Som.	1	0
Kidner, S.	Bickley Farm, Milverton, Somerset	1	0
Kidner, W.	Fennington, Kingston, Taunton	1	0
Kindersley, E. L.	Clyffe, Dorchester	1	0
King, G. F.	Chewton Keynsham, Bristol	1	0
King, J. M.	3, Powis Road, Brighton	1	0
King, J. P.	North Stoke, Wallingford	1	0
King, R. Moss	Ashcott Park, Bridgwater	1	0
King and Son, R.	Milsom Street, Bath	1	1
King, Sir Wm. D.	Stratford Lodge, Southsea	0	10
Kingscote, T.	The Trench, Tonbridge	1	0
Kinneir, H.	Redville, Swindon	1	0
Kirkham, W.	Bangley Farm, Tamworth	1	0
†Knight, Sir F. W., K.C.B.	Simonsbath, South Molton		. .
Knight, R.	Troytes Farm, Tivington, Minehead	0	10
Knight, S. J.	Dundry, Somerset	1	0
†Knollys, C. R.	Grange Cottage, Alresford, Hants		. .
†Kruse, W.	Leeds, near Maidstone		. .
†Lake, C.	Oakley, Higham, Kent		. .
Lakeman, Thos.	Brixham, Devon	0	10
Lambert, G., M.P.	Spryton, North Devon	1	1
Lamoreaux, G.	6, Bovingdon Villas, Plympton	1	0
Lamport, Messrs. C.	Bindon House, Wellington, Som.	1	0
Lance, C. E.	Stoke Court, Taunton	1	0
Lane, A. P.		1	1
Lang, W. and J.	Hambridge, Somerset	1	0
Langley, B. W.	King's Lynn, Norfolk	1	0
Langworthy, W. F.	Clevedon, Somerset	1	0
*Lansdowne, Marquis of	Bowood, Calne	2	0
Lascelles, Rev. E.	Newton St. Loe, Bristol	1	0
†Latham, T.	Dorchester, Oxon		. .
Laurie, A. P.	49, Beaumont Square, London, E.	1	0
Laver, J. G.	Northover, Glastonbury	1	0
Laverton, W. H.	Leighton House, Westbury, Wilts	2	0
Lawrence, J. H. H.	1, Lynwid Villas, Bath	1	1
Lawson, H. G., M.P.	Taplow, Bucks	2	0
Leconfield, Lord	Petworth, Sussex	2	0
Lee, Major Gen. H. H.	The Mount, Dinas Powis, near Cardiff	1	0
[illegible]	Beaufort Arms Hotel, Raglan.	0	10
[illegible]	South Lychett Manor, Poole, Dorset	1	1
[illegible]	Melplash Court, Melplash, Dorset	1	0

Name.	Residence.	Subscriptions. £	s.	d.
	Court Lodge, West Farleigh, Kent	1	0	0
Sir J. Farnaby,	Wickham Court, West Wickham, Kent	3	0	0
Charles	Carlton Club, Pall Mall, London	1	0	0
, J. C. Baron	Tregeare, Launceston	. .		
, W.	Courtlands, Lympstone	2	0	0
/.	Woolleigh Barton, Beaford, North Devon	0	10	0
es	Plasdraw, Aberdare	1	1	0
V. T.	The Mardy, Aberdare	1	0	0
., and Son	*Herald* Office, Bath	1	0	0
Henry	Trehill, Exeter	. .		
. J.	Haggerston Castle, Beal, Northumberland	. .		
M.D.	Silver Street House, Taunton	1	0	0
R. C. C.	Over Court, near Bristol	1	0	0
t.	Frogholt, Hythe, Kent	1	0	0
Earl of	Crosswood, Aberystwith, S. Wales	. .		
	Warninglid Grange, Haywards Heath	. .		
., and Co.	Dursley, Gloucestershire	1	1	0
k, Baron	The Hendre, Monmouth	. .		
Evan H., M.P.	Langford Court, Langford, Bristol	1	1	0
W. J.	Southwood, Tiverton	1	0	0
Sir J. T. D., Bart.,	Penllergare, Swansea	2	2	0
ert	Plas Cilybebyll, Swansea	1	1	0
	Saltford, near Bristol	1	0	0
. E.		1	0	0
igh, Earl of	Londesborough Park, Market Weighton	1	0	0
	Ogbourne St. Andrew, Marlborough	1	0	0
Hon. Walter H.,	Rood Ashton, Trowbridge	. .		
William	Woodlands, Congresbury, Somerset	1	0	0
. Buller	Maristow, Roborough, Plymouth.	1	0	0
M., Bart.	Maristow, Roborough, Devon	2	0	0
	Langport	1	0	0
nos	Winsford, Dulverton	0	10	0
	Bossington, Allerford, Taunton	1	0	0
C.	St. James' Dairy, Bath.	1	0	0
r John, Bart., M.P.	High Elms, Hayes, Kent	. .		
B.	Brockampton, Worcester	. .		
pt. A. F.	Court House, East Quantoxhead, Bridgwater	1	0	0
v. A. H. F.	Minehead, Bridgwater	1	0	0
F.	Dunster Castle, Somerset	1	0	0
, J. J.	Lukesland, Ivybridge	2	0	0
, H. L. B.	Bishopswood, Ross.	1	1	0

Name.	Residence.	Subscriptions. £	s.	d.
McIntosh, Mrs. C. M.	Havering Park, Havering Atte Bower, Essex	1	0	0
McMullen, A. E.	Vale House, Hertford	1	0	0
Major, H. J., and C. (Limited)	Bridgwater	1	0	0
Mallock, Richard, M.P.	Cockington, Torquay	1	0	0
Manfield, J.	Hambridge, Curry Rivell, Taunton	1	1	0
†Mansell, A. E.	Astol, Shifnal, Salop	. .		
Maple, Sir J. B., Bart., M.P.	Childwickbury, St. Albans	1	0	0
Marcus, M.	High Trees, Redhill, Surrey	1	0	0
Marker, Richard	Combe, near Honiton	1	0	0
Marshall, J. T.	Highridge Farm, Dundry, Somerset	0	10	0
Marshall, Sons, and Co.	Britannia Iron Works, Gainsboro'	1	1	0
Marten, G. N.	Marshals Wick, St. Albans	1	0	0
Martin, Christopher	Broad Clyst, Exeter	0	10	0
†Martin, G. E.	Ham Court, Upton-on-Severn	. .		
Martin, J.	Thorverton, R.S.O., Devon	1	0	0
*Maskelyne, N. Story	Basset Down House, Swindon	2	2	0
Mason, A.	North Hill, Swansea	1	0	0
*Mason, J.	Eynsham Hall, Oxon	2	0	0
Massey, F. I.	54 & 55, Bunhill Row, London, E.C.	1	0	0
Mathews, Ernest	Chequers Mead, Potters Bar	1	0	0
Mathias, W. H., J.P.	Porth, near Pontypridd	1	0	0
Maule, M. St. John	Chapel House, Bath	1	0	0
May, A. C.	Park House, Cotham Park, Bristol	1	0	0
Maynard, W. T.	Yeovil	1	0	0
†Mayo, Henry	4, Temple Terrace, Dorchester	. .		
†Mayo, John	Coker's Frome, Dorchester.	. .		
McMurtrie, J.	Southill, Radstock, near Bath	1	0	0
Meade, F.	Langport, Somerset	1	0	0
Medland, W. R.	Yard Farm, Silverton, Cullompton	0	10	0
Medlicott, Henry E.	Potterne, Devizes	1	0	0
Merry, Richard	Goulds, Broad Clyst, Exeter	1	0	0
Merry, W. F.	Ash Clyst, Broad Clyst, Exeter	1	0	0
Merryweather, J. C.	Hollies, Blackheath	1	0	0
Methuen, Major-Genl. Lord, C.B., C.M.G.	Corsham Court, Wilts	1	0	0
Micklem, H.		1	0	0
Middleton, Hastings N.	Bradford Peverell, Dorchester.	1	0	0
Mildmay, Rev. A. St. J.	Hazlegrove, Sparkford, Bath	1	1	0
Mildmay, Capt. C. B. St. J.	Hallam, Dulverton	1	0	0
Mildmay, Sir H. St. John, Bart.	Dogmersfield Park, Hartford Bridge, Winchfield	. .		
Mildred, G. B.	Butleigh, Glastonbury	. .		
Miles, A.	Winchcombe Street, Cheltenham	1	0	0
Miles, H. R.	Abbots Leigh, Clifton, Bristol	. .		
Millard, H.	Shrivenham, Berks	1	0	0
Millard, J. F.	Butleigh, Glastonbury	1	0	0
Mills, P. L.	Ruddington Hall, Nottingham	1	0	0
Minton, T. S.	Montford, Shropshire, R.S.O.	1	0	0

Name.	Residence.	Sub- scriptions.		
		£	s.	d.
use, H.	St. George's Hill, Easton-in-Gordano	1	0	0
ell, F. J.	Llanfreckfa Grange, Caerleon, Mon.		. .	
C. J.	5, Buckingham Gate, London, S.W.	1	0	0
gu, Lord	Palace House, Beaulieu, Hants	2	0	0
iore, Sir F., Bart.	Worth Park, Crawley	1	1	0
C.	Weston House, Evercreech	1	0	0
, H. F.	42, Angel Road, Brixton, London, S.W.		. .	
-Stevens, J. C.	Winscott, Gt. Torrington, Devon	3	0	0
on, Lord	Sarsden House, Chipping Norton	2	2	0
, H.	Woolcombe, Wellington, Somerset	1	0	0
n, Hon. F. C.	Ruperra Castle, Newport, Mon.	2	0	0
-Richardson, C.	Noyadd Wilym, Cardigan	1	0	0
d, Charles W.	Elmscroft, West Farleigh, Maidstone	1	1	0
y, Earl of	Saltram, Plympton, Devon	2	0	0
ll, G. Herbert, M.P.	Headington Hill Hall, Oxford	2	2	0
and Griffin (Limited)	Maindee, Newport, Mon.	1	1	0
, Son & Peard	Auctioneers, North Curry, Taunton	1	0	0
Sir R. A.	Sketty Park, Swansea	1	0	0
W.	4, Norton Road, Hove, Brighton.	1	0	0
son, Alfred	Fonthill House, Tisbury		. .	
t, G. W.	Wasing Place, Reading		. .	
t-Edgcumbe, Earl of	Mount-Edgcumbe, Devonport	2	2	0
stevens, J.	Railway Hotel, Yatton	1	0	0
low, E.	Castlehead Grange, Lancashire		. .	
low, E., jun.	Bury, Lancashire		. .	
ns, W. H.	Westfield Place, Battle, Sussex	2	2	0
s, T.	Aberfeldy, The Shrubbery, Weston-super-Mare	1	0	0
, Capt. G.	Elmsleigh, Send, Woking	1	0	0
, P. A., M.P.	Dunsmore, near Rugby	1	0	0
y, Col. Wyndham, M.P.	10, Rutland Gate, London, S.W.	1	0	0
y-Anderdon, H. Edward	Henlade House, Taunton	1	1	0
Col. W. D.	84, Cornwall Gardens, London, S.W.	1	0	0
, H. B.	Chippenham	1	1	0
r, G.	Lee Farm, Wisboro' Green, Billingshurst, Sussex	1	1	0
, F.	Macknade, Faversham	1	1	0
Sir A. W., Bart.	Grittleton, Chippenham	1	0	0
, C. W.	Carnarvon Arms, Dulverton, Somerset.	0	10	0
W. W.	The Grange, Wenvoe, Glamorgan	1	0	0
le-Grenville, Robert	Butleigh Court, Glastonbury		. .	
n, F. M.	Barton Grange, Taunton	1	0	0

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Name.	Residence.	Sub-scriptions. £	s.	d
†Newton, J. G.	Millaton House, Bridestowe, Okehampton	.	.	
Nix, Mrs. S.	Tilgate, Crawley, Sussex	1	0	
Nock, E.	Brockton House, Shifnal, Salop	1	0	
*Normanton, Earl of	77, Pall Mall, London, S.W.	2	0	
Norman, H. T.	Cushuish, Kingston, Taunton.	1	0	
Norrish, Thomas	Churchill Farm, Loxbeare, Tiverton	0	10	
Northcote, Hon. Sir S. H., Bart., M.P.	25, St. James's Place, London, S.W.	1	0	
*Northumberland, Duke of	Albury Park, Surrey	5	0	
Norton, R.	Woodbourne, Shepton Mallet	1	1	
Okeden, Col. U. P.	Turnworth, Blandford	1	0	
Oldfield, W.	Berrers Hall, Walton, S.O., Norfolk	1	0	
Oliver-Bellasis, Captain	Shilton House, Coventry	1	0	
*Onslow, Earl of, G.C.M.G.	7, Richmond Terrace, Whitehall, London, S.W.	2	0	
†Ormerod, Miss E. A.	Torrington House, St. Albans	.	.	
Paget, L. C.	Amerdown, Radstock	1	0	
*Paget, Rt. Hon. Sir R. H., Bt.	Cranmore Hall, Shepton Mallet	2	0	
Pain, Charles	Grosvenor House, Stockbridge, Hants	1	1	
Palairet, H. H.	Cattistock Lodge, Dorchester	1	1	
Palfreman, L.	Ingrams Farm, Loxbeare, Tiverton	0	10	
Palmer, Geo.	Marlston House, Newbury, Berks	1	0	
Palmer, G. W.	Elmhurst, Reading	1	0	
†Palmer, R.	Lodge Farm, Nazeing, Waltham Cross	.	.	
Parfitt, J.	Selwood Dairy, Frome	1	0	
Parker, Admiral	Delamore House, Ivybridge	1	0	
†Parker, Hon. Cecil J.	Eaton Estate Office, Eccleston, Chester	.	.	
Parker, Col. R. J. H.	Bywood Cottage, Woolston, Southampton	1	0	
Parker, H. C. G.	Brockton Grange, Shifnal, Salop	1	0	
Parker, T.	High Street, Shepton Mallet	1	0	
Parkin, Paxton William	3, Major Terrace, Seaton, Devon	1	0	
Parmiter, Wm	The Axe, Crewkerne	.	.	
Parrington, M. B.	Holborough Cottage, Rochester	1	0	
Parry, T.	Newport, Mon.	1	0	
Parsons, H. J. D.	Bampfylde House, Exeter	.	.	
Parsons, J. D. [illegible]ogood, Jun.	Ashurst Place, Langton, Tunbridge Wells	.	.	
[illegible] M. F.	Misterton, Crewkerne, Somerset	1	0	
Part, C. T.	Aldenham Lodge, Radlett, St. Albans	1	0	

Name.	Residence.	Sub-scriptions £	s.	d.
Partridge, Capt. W. St. Ives.	The Coppice, Bishopswood, Ross.	1	0	0
Partridge, H.	Castle Hill, Bletchingley, Surrey	1	0	0
Pass, A. C.	The Holmes, Stoke Bishop, Bristol	1	0	0
Peacock, E.	14, Union Street, Bath. . . .	1	0	0
Pearson, E. & W.	African Chambers, Liverpool. .	1	0	0
Pearson, J. W.	Shirley, Southampton	1	1	0
Pember, G. H.	Tangier Park, Basingstoke . .	1	0	0
Pendarves, W. Cole . . .	Pendarves, Camborne, Cornwall.	1	1	0
Penny, Thomas	Taunton	1	0	0
Penny, T. S.	Musgrove Farm, Taunton. . .	1	0	0
Percival, P.	Somerset Court, Brent Knoll, Highbridge.	1	1	0
Perkins, Col. E. K. . . .	Wyntersted, Southampton . .	1	0	0
†Perry-Herrick, Mrs. . . .	Beau Manor Park, Loughborough		. .	
Peters, J.	Mark House, Mark, Highbridge.	1	0	0
†Peters, Wm. Parsons . . .	2, Park Villas, Ashley Road, Epsom		. .	
Petherick, R.	Acland Barton, Landkey, Barnstaple	0	10	0
†Pettifer, T. Valentine, F.R.C.V.S.L.	The Limes, Tetbury, Gloucester.		. .	
†Phillips, C. D.	The Gaer, Newport, Monmouth .		. .	
Phillpotts, Rev. H. J. . . .	Walkern Rectory, Stevenage. .	1	1	0
Philp, Capt.	Pendoggett, Timsbury, near Bath	1	1	0
Phippen, C. C.	Weston Bampfield, Sparkford, Bath	1	0	0
Picksley, Sims, and Co., Lmtd.	Bedford Foundry, Leigh . . .	1	0	0
Piggott Brothers and Co. . .	59, Bishopsgate Street Without, London	1	0	0
Pike, W.	High Pennard House, Bryn Road, Swansea	1	0	0
†Pinckney, Erlysman C. . .	Berwick St. James, Salisbury .		. .	
Pinney, F.	The Grange, Somerton, Somerset.	1	0	0
†Pinney, R. W.	Farnley House, Dursley, Glos. .		. .	
†Pinney, W..	Somerton, Somerset.		. .	
*Poltimore, Lord	Poltimore Park, Exeter. . . .	3	3	0
Polwhele, Thos. R.. . . .	Polwhele, Truro	1	1	0
Pond, S.	Blandford, Dorset	1	0	0
Ponsford, T.	Minehead, Somerset.	1	0	0
Ponter, E.	9, 10 and 11, Queen Square, Bath	1	0	0
Poole, A. R.	12, Chester Place, Hyde Park Square, London, W.	1	0	0
Poole Bros.	Marksbury, near Bath	1	0	0
Pope, Alfred	Dorchester	1	0	0
Pope, John	The Shrubbery, Barnfield, Exeter	1	0	0
Pope, R. J.	Beresford Manor, Plumpton, Lewes	1	0	0
†Pope, Rev. W. J. P. . . .	Godmanstone Rectory, Dorchester		. .	
Porch, J. A.	Edgarley, Glastonbury. . . .	1	0	0
*Portal, Melville.	Laverstoke House, Micheldever .	2	0	0
Portal, Wyndham	Malshanger, Basingstoke . . .	1	0	0
†Porter, R.	Denewood, Broadlands Road, Highgate, London, N. . . .		. .	
†Portman, Hon. C. B. . . .	Child-Okeford, Blandford, Dorset		. .	

Name.	Residence.	Sub-scriptio £	s.
†Portman, Hon. E. W. B.	Hestercombe, Taunton	.	.
*Portman, Viscount	Bryanston, Blandford	5	0
Potter, F. P.	Gate Works, King's Lynn	1	0
Poulett, The Earl	Hinton St. George, Crewkerne	1	0
Powell, R. H.	Lewes, Sussex	1	0
Power, M. K. M.	Aston Court, Ross	1	0
*Poynder, Sir J. Dickson, Bart., M.P.	Hartham Park, Corsham	2	0
Pratt, J. D.	Pratts Hayes, Exmouth	1	0
Price, J. W.	Newport Pottery Co., Newport, Mon.	1	0
*Prior, R. C. A.	Halse House, near Taunton	2	0
Pritchard, W.	Terrace House, Rhymney, Cardiff	1	0
Proctor and Ryland	Carr's Lane, Birmingham	1	1
Proctor, H. and T.	Cathay, Bristol	1	1
Pulley, Sir J.	Lower Eaton, near Hereford	1	0
†Purgold, A. D.	Park View Farm, Combermere, Whitchurch, Salop	.	.
Purrott, W.	Cunnynhame Hill, St. Albans	1	0
Pyatt, G. H.	Park Farm, Bath	1	0
*Ramsden, J. C.	Busbridge Hall, Godalming	2	0
Ransome, James Edward	Orwell Works, Ipswich	1	1
Rashleigh, Jonathan	Menabilly, Par Station, Cornwall	1	0
Rawlence, Ernest A.	Newlands, Salisbury	1	0
Read, B.	New Barn Farm, Keynsham	1	0
Reeves, Robert and John, and Son	Bratton Iron Works, Westbury, Wilts	1	0
Reid, A.	Livingshayes, Silverton	1	0
Reid, P. V. A.	Belcombe Brook, Bradford-on-Avon	1	0
Rendell, R. F.	Kingston House, Staverton, Totnes	1	0
Reynolds, W.	High Ham, Langport	0	10
Rich, F. W.	Royal Nurseries, Sandford, Bristol	1	0
Richards, T. B.	East Pennard, Somerset	1	0
Richards, W. F.	Beaumont, Broad Clyst, Exeter	1	0
Richardson, E. E.	Glanbrydan Park, Carmarthen	1	0
Richardson, J. C.	Glanbrydan Park, Manordilo, R.S.O., Carmarthen	1	0
Rickard, Silas	Newlyn East, Grampound Road, Cornwall	1	0
Ridler, James	Blackford, Selworthy, Minehead	1	0
Ridler, T. K.	Minehead, Taunton	1	0
Rigden, Henry	Lyminge, Hythe, Kent	1	0

Name.	Residence.	Sub-scriptions.		
		£	s.	d.
nl. Fox-Pitt . . .	Rushmore Lodge, Salisbury . .	1	0	0
, Lord	Lanhydroc, Bodmin	2	0	0
. and H. (Limited)	Deanshanger Ironworks, Stony Stratford, Bucks	1	0	0
. D. Cramer . . .	Thornton, Frant, Sussex . . .	1	1	0
., and Son . . .	Bridgwater	1	1	0
, R. T.	The Church Farm, Babraham, Cambridge	1	0	0
. . . .	High Bray, South Molton . .	0	10	0
S.	Lynhales, Kington, Herefordshire	1	0	0
John, and Co. . .	Bristol	1	1	0
& Auden (Limited)	Wantage, Berks	1	0	0
W. Buckley . . .	Llanelly	1	0	0
. . . .	West Pennard, Glastonbury . .	1	0	0
n. Mark	Stevenstone, Torrington . . .	1	1	0
ames	West Town, R.S.O., near Bristol	1	0	0
, Lord	Tring Park, Herts	1	0	0
. . . .	Banham, Attleborough, Norfolk.	1	0	0
E. L.	Hall Place, Cranleigh, Guildford	1	0	0
ernsey Agricultural rticultural Society .	Guernsey	1	0	0
. . . .	Todenham, Moreton-in-Marsh .	1	0	0
H.	Sherborne	0	10	0
d Proctor	Sheaf Iron Works, Lincoln . .	1	1	0
, J. A.	Highclere Castle, Newbury, Berks	1	0	0
. . . .	North Cadbury, Bath	1	0	0
Howard P. . . .	Moxhull Park, Erdington . . .		. .	
. . . .	Buchan Hill, Crawley, Sussex .	1	0	0
, T. H.	Beckington Rectory, Bath . . .	1	0	0
rmans, Earl of . .	Port Elliot, St. Germans, R.S.O., Cornwall	3	3	0
Lord P.	Barton Hall, Loughborough, Leicester	1	0	0
. C.	North Fields, Bridgwater . . .	1	0	0
V.	Yonder Broadpool Farm, Doulting, Shepton Mallet	1	0	0
njamin	Newlands, Broad Clyst, Exeter .	1	0	0
, Rt. Hon. Sir B., ...	Banbury	1	0	0
, Ernest	Bodicote Grange, Banbury . .	1	1	0
. A.	Stoke House, Exeter	1	0	0
E. J.	Stoke House, Exeter		. .	
ev. L.	Rectory, Whimple, Devon . . .	1	0	0
C. A.	Nynehead, Wellington, Somerset	1	1	0
V. A.	Nynehead, Wellington, Somerset	1	0	0
C. M.	Boracott, Brandiscorner, N. Devon	1	0	0
G., jun.	Lydeard House, Taunton . . .	1	0	0
. H. B. O.	4, Rodney Place, Clifton . . .	1	1	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
*Scobell, Col. Barton L. J.	Kingwell Hall, High Littleton, near Bristol	2	2	0
Scott-Hall, H.	Dormington Court, Hereford	1	0	0
Scott, R. W.	East Lambrook, S. Petherton	1	0	0
†Scott, T.	Ditton Court, Maidstone		. .	
*Scratton, D. R.	Ogwell, Newton Abbott	2	2	0
Search, Miss B.	Cowie, Stonehaven, N.B.	1	0	0
†Seaton, Lord	Nutwell Court, Lympstone, Devon		. .	
Sellick, Jas.	Courtlands, Brompton Ralph, Wiveliscombe	0	10	6
Senior, H.	Rushton, Blandford, Dorset	1	0	0
†Seymour, R. A. H.	46, Earl Street, Maidstone (Hon. Local Sec., 1884)		. .	
Shackell, R.	Lower Swainswick House, Bath	1	0	0
Shakerley, Col. H. W.	Burgate, Godalming	1	0	0
Shaw, J. C.	Deane Court, Bishops Lydeard, Somerset	1	0	0
†Shaw-Stewart, Walter R.	Berwick House, Hindon, Salisbury		. .	
Shears, W.	Lee Farm, Pyrford, Woking Station	1	0	0
Shelley, Sir John, Bart.	Shobrooke Park, Crediton	1	1	0
Sheppy, J.	Iwoods House, Congresbury, Bristol	1	0	0
†Sherston, Major C. D.	Evercreech, Somerset		. .	
†Sherston, T. P. D.	Evercreech, Bath		. .	
Shore, J. H.	Whatley House, Frome	1	0	0
Sillifant, A. O.	Coombe House, Copplestone, N. Devon	1	0	0
Silvester, F. W.	Hedges, St. Albans	1	0	0
Sims, G. T.	Land Agent, Abbey Road, Neath	1	0	0
†Simmons, Henry	Bearwood Farm, Wokingham		. .	
Simpson, F. C.	Maypool, Churston Ferrars, R.S.O., S. Devon	1	0	0
*†Singer, A. M.	Redworth, near Totnes		. .	
*Singer, W. M. G.	Streatfield, Paignton, Devon	5	0	0
Skinner, A. C.	Pound Farm, Bishop's Lydeard, Taunton	1	0	0
*Skrine, Henry Duncan	Claverton Manor, Bath	2	0	0
Skrine, Col. H. M.	Warleigh Manor, Bath	1	1	0
Slade, A. H.	Stock Exchange, London, E.C.	1	0	0
*Slater, A.	Gloucester Carriage Works, Gloucester	2	2	0
Smart, G. E.	Combe Hay Manor, Bath	1	1	0
Smith, A. J.	Highgrove, Totterdown, Bristol	1	0	0
*Smith, Hon. W. F. D., M.P.	Greenlands, Henley-on-Thames	5	0	0
Smith, Hugh C.	Mount Clare, Roehampton	1	0	0
†Smith, J. W.	Thinghill Court, Hereford		. .	
†Smith, S. Lee	Larkfield, Maidstone		. .	
Smith, W.	Sundon House, Clifton Down, Bristol	1	0	0

Name.	Residence.	Sub-scriptions.		
		£	s.	d.
Smithells, E.	Settle, Yorkshire	1	0	0
*†Smyth, Sir J. H. Greville, Bart.	Ashton Court, Bristol		. .	
Solley, G. C.	Clarence House, Sandwich	0	10	0
Somer, J.	Broad Clyst, Exeter	1	0	0
*Somerset, Duke of	Maiden Bradley, Bath	2	0	0
Somerset Trading Co.	Bridgwater	1	1	0
†Somerville, A. F.	Dinder House, Wells, Somerset		. .	
Southwell, F. C.	41, Upper Thames Street, London, E.C.	1	0	0
†Spackman, Henry	6, Terrace Walk, Bath		. .	
†Spearman, Sir J., Bart.	The Hall, Wem, Salop		. .	
Speed, W. S.	Mill Farm, Priston, Bath	1	0	0
Speke, W., jun.	Jordans, Ilminster	1	1	0
Spencer, J. M.	Oakhill, Bath	1	0	0
Spencer, S.	Holywell Manor, St. Ives, Hunts	1	0	0
Spencer, W. C.	North Perrott, Crewkerne	1	0	0
Spicer, Capt.	Spye Park, Chippenham	1	0	0
Spicer, C.	Manor Farm, Bishops Caundle, Sherborne	1	0	0
Spire, Joseph	High Street, Glastonbury	1	0	0
Spratts' Patent (Limited).	Henry Street, Bermondsey, London	1	0	0
Spurway, Rev. Edward	Heathfield, Taunton	1	0	0
Stacey, P.	Bude Haven, N. Cornwall	0	10	0
Stallard, W.	Sunny Lodge, Malvern Link	1	0	0
Standish, Miss L.	New Park, Brockenhurst, Hants	1	0	0
Stanford, A.	Eatons, Steyning, Sussex	1	0	0
†Stanford, W.	Eatons, Steyning, Sussex		. .	
Stanhope, Hon. and Rev. B. L. S.	Byford Rectory, Hereford	1	0	0
*Stanley, E. J., M.P.	Quantock Lodge, Bridgwater	2	0	0
Stark, R.	Yelfords, Chagford, Devon	1	0	0
Starkey, T.	Heatherton Park, Taunton	1	0	0
Starkie, Mrs.	Mitchells, Saffron Walden	1	0	0
Steeds, A.	Red House Farm, Stratton-on-the-Fosse, Bath.	1	0	0
†Stephens, Darell	Trewornan, Wadebridge, Cornwall		. .	
Stephens, H. C., M.P.	Avenue House, Finchley, N.	1	0	0
Stephens, Julian	19A, Coleman Street, London, E.C.	1	0	0
*Stevens, J. W. A.	Penhill, Cardiff	2	0	0
Stevens, R. N.	Woodham Hall, Woking, Surrey	1	0	0
Stevens, W.	Budlake, Broad Clyst, Exeter	1	0	0
Still, Henry	Addington House, Addington, Croydon	1	0	0
Stokes, C. W. Rees	Town Clerk, Tenby	1	0	0
Stone, George.	Camerton, Bath	1	0	0
Stone, John S.	Clarence Place Works, Newport, Mon.	0	10	6
Stotbert, P. K.	Keynsham Manor, Saltford, Bristol	1	0	0
†Strachey, E., M.P.	Pensford, Somerset		. .	
Strangways, Hon. H. B. T.	Shapwick, Bridgwater	1	1	0

Name.	Residence.	Subscriptions.		
		£	s.	d.
Stratton, Richard	The Duffryn, Newport, Mon.	1	0	0
Stretton Hills Mineral Water Company	Church Stretton	1	0	0
*Strickland, A. L.	23, Warwick Square, London, S.W.	2	0	0
Stroud, J. S. G. W.	Kingshill House, Knowle, Bristol	1	0	0
Stubs, Peter	Blaisdon Hall, Newnham, Gloucestershire	1	0	0
Stuckey, Vincent	Hill House, Langport	1	0	0
*Stucley, Sir G. S., Bart.	Moreton, Bideford	2	0	0
Studdy, T. E.	Estate Office, Basing Park, Alton	1	0	0
Studts, H.	Swansea	1	0	0
Sturge, William	Bristol	1	1	0
*Sutton, M. J.	Wargrave Manor, Twyford, R.S.O., Berks	2	0	0
*Sutton and Sons	Seedsmen, Reading	2	2	0
Swanwick, R.	College Farm, Cirencester	1	0	0
Swayne, W. T	Glastonbury	1	0	0
Swithinbank, H.	Denham Court, Denham, Bucks.	1	0	0
Symes, J. H.	Coat Farm, Martock	1	0	0
Symons, J., and Co. (Limited)	The Plains, Totnes	1	0	0
Talbot, Miss	Margam Park, Port Talbot	1	0	0
Tamlyn, P. Horden	Boode House, Braunton, N. Devon	1	1	0
Tangyes (Limited)	Cornwall Works, Birmingham	1	0	0
Tanner, E. F.	Hawson Court, Buckfastleigh	1	0	0
Tapp, David James	Knaplock, Winsford, Dulverton	1	0	0
Tapp, John	Winsford, Dulverton	0	10	0
Tasker, W., and Sons	Andover	1	1	0
Tate, J. A.	Fairfield, Wells, Somerset	1	0	0
Tayleur, C. W.	Hampton, St. Mary Church, Torquay	1	0	0
†Taylor, George	Crauford, Hounslow, W.		. .	
Taylor, H. W.	Showle Court, Ledbury, Hereford	1	0	0
†Tazewell, W. H.	Manor House, Taunton St. Mary's		. .	
*Temple, Earl	Newton Park, Newton St. Loe	2	2	0
Templeman, G. D.	Haselbury, Crewkerne	1	0	0
Thody, W. T.	386, Clapham Rise, London, S.W.	1	0	0
Thomas J.	Nantymadog, Senny Bridge, Brecon	1	0	0
Thomas, J. C.	The Lodge, Colyford, Axminster.	1	0	0
Thompson, G. R., F.C.S.	57, Dock Street, Newport, Mon.	1	0	0
Thomson, Col. White	Broomfield Manor, Exbourne, N. Devon	1	0	0
†Thorley, Joseph	Thornhill Bridge, Caledonian Road, King's Cross, London, N.		. .	
Thorley, J.	Ringdale House, Faringdon, Berks.	1	0	0
Thorne, C. G.	Curdon Farm, Williton, Somerset	1	0	0

Name.	Residence.	Sub-scriptions.		
		£	s.	d.
T.	West Yard, N. Molton	0	10	0
T. G.	Horridge, Romansleigh, S. Molton	0	10	0
John	Great Yardley, Withypool, Taunton	0	10	0
, John	Corfe Hill, Weymouth	1	0	0
). T.	Central Hall, Bedford	1	1	0
. Huntley	Alford House, Castle Cary	1	1	0
orton, Sir N. W.,	Buckland, Faringdon, Berks	1	0	0
G. R.	Stowmarket	1	0	0
, Lord A.	48, Berkeley Square, London, W.	2	0	0
, Lord H.	Muntham, Worthing	2	0	0
liam	Treworgan, Ross	1	0	0
. T. S.	Quaish Farm, N. Woolton, Shepton Mallet	1	0	0
. C., and Son	Kingswood Road, Mosely, Birmingham	1	0	0
A.	Holland Park Dairy, London	1	0	0
W.	Implement Maker, Warminster	1	0	0
l, John	Upper Winchendon, Aylesbury	1	0	0
r, Lord	Tredegar Park, Newport, Mon.	2	2	0
Hon. J.	Thorncombe, Crowcombe, Taunton	1	0	0
, J. T.	Hobbacott Farm, Launcells, N. Cornwall	1	0	0
, James	Tregonning, St. Columb Minor, Cornwall	1	0	0
, W. H.	Trerice, Newlyn East, Cornwall.	1	0	0
, W. H.	Sherborne, Northleach, Cheltenham	1	0	0
yne, John	Heligan, St. Austell	.	.	
, E. B. Cely	Port Town, Taunton	1	0	0
, W. H.	Ryne Hill, Kingham, Chipping Norton	1	0	0
E. R.	The Elms, Frome	1	1	0
Chafyn-Grove, G.	North Coker House, Yeovil	.	.	
W.	Borough Farm, Broad Clyst, Exeter	1	0	0
I. B.	Bath and Somerset Dairy Company (Limited), Bath	1	0	0
W. W.	Trivetts Farm, Cossington, Somerset	1	0	0
V.	Leinthall, Ludlow	1	0	0
, C. C.	Cedars, Wells, Somerset	.	.	
A. P.	The Leen, Pembridge, Hereford	1	0	0
rothers	Milsom Street, Bath	1	0	0
ian, A. C.	Castlecroft, Wolverhampton	1	0	0
I. S.	Hylesbrook, Langford, Somerset	1	0	0
hn	291, Edgware Road, London	1	0	0
.	Tiverton	1	0	0
W. A.	Sloperton Cottage, Chippenham	1	0	0

Name.	Residence.	Sub-scriptions.		
		£	s.	d.
Valletort, Viscount	Mount Edgcumbe, Devonport	1	1	0
Vaughan, W.	Doublegates Farm, Bushley, Tewkesbury	1	0	0
Vellacott, H. W. Hopper	Stone Farm, Exford, Taunton	1	0	0
†Verulam, Earl of	Gorhambury, St. Albans		. .	
Vezey, H. J.	Long Acre, Bath	1	1	0
Vezey, Jas.	The Chequers, Box, Wilts.	1	0	0
Vipan and Headley	Leicester	1	0	0
Vosper, W. P.	Saltram Farm, Plympton, Devon.	1	0	0
Waddle, H.	Llanelly	1	1	0
Waide, W., and Sons	Churn Works, Leeds	1	0	0
Wainwright, C. R.	Shepton Mallet	1	0	0
Walker, —	c/o Messrs. Starkey, Knight & Co., Bridgwater	1	1	0
†Wallace, Major, R.H.A.	Army and Navy Club, London		. .	
Wallis and Steevens	North Hants Iron Works, Basingstoke	1	0	0
*Walrond, Sir W. Hood, Bart., M.P.	Bradfield, Cullompton, Devon.	2	0	0
†Walsingham, Lord	Merton Hall, Thetford, Norfolk		. .	
Wantage, Lord, K.C.B., V.C.	Lockinge Park, Wantage	1	0	0
Warde, F.	Aldon, Addington, West Malling	1	0	0
†Waring, C. E.	Charles Street, Cardiff		. .	
Waring, H. F.	46, Earl Street, Maidstone	1	0	0
Warne, C. G.	Weston-super-Mare	1	1	0
†Warner, T. C., M.P.	Woodford, Essex		. .	
†Warre, Frederick	44, Great Ormond Street, Bloomsbury, London		. .	
Warre, Rev. E., D.D.	Eton College, Windsor	1	0	0
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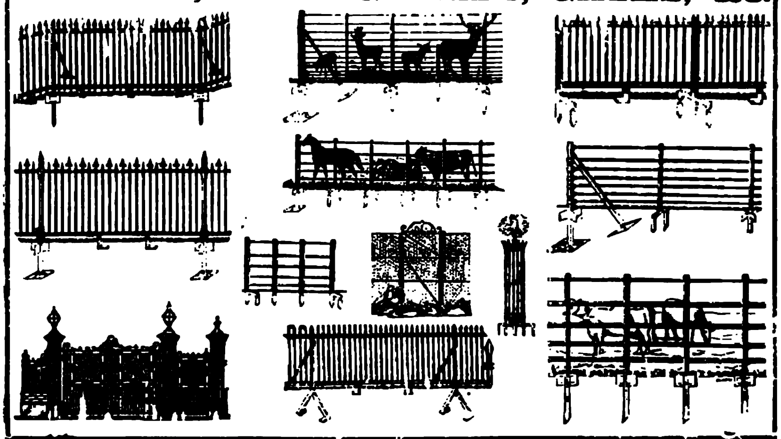

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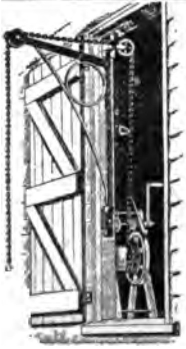

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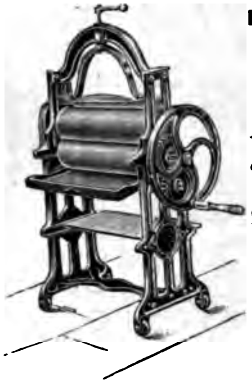

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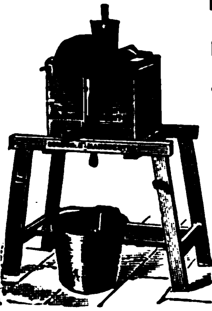

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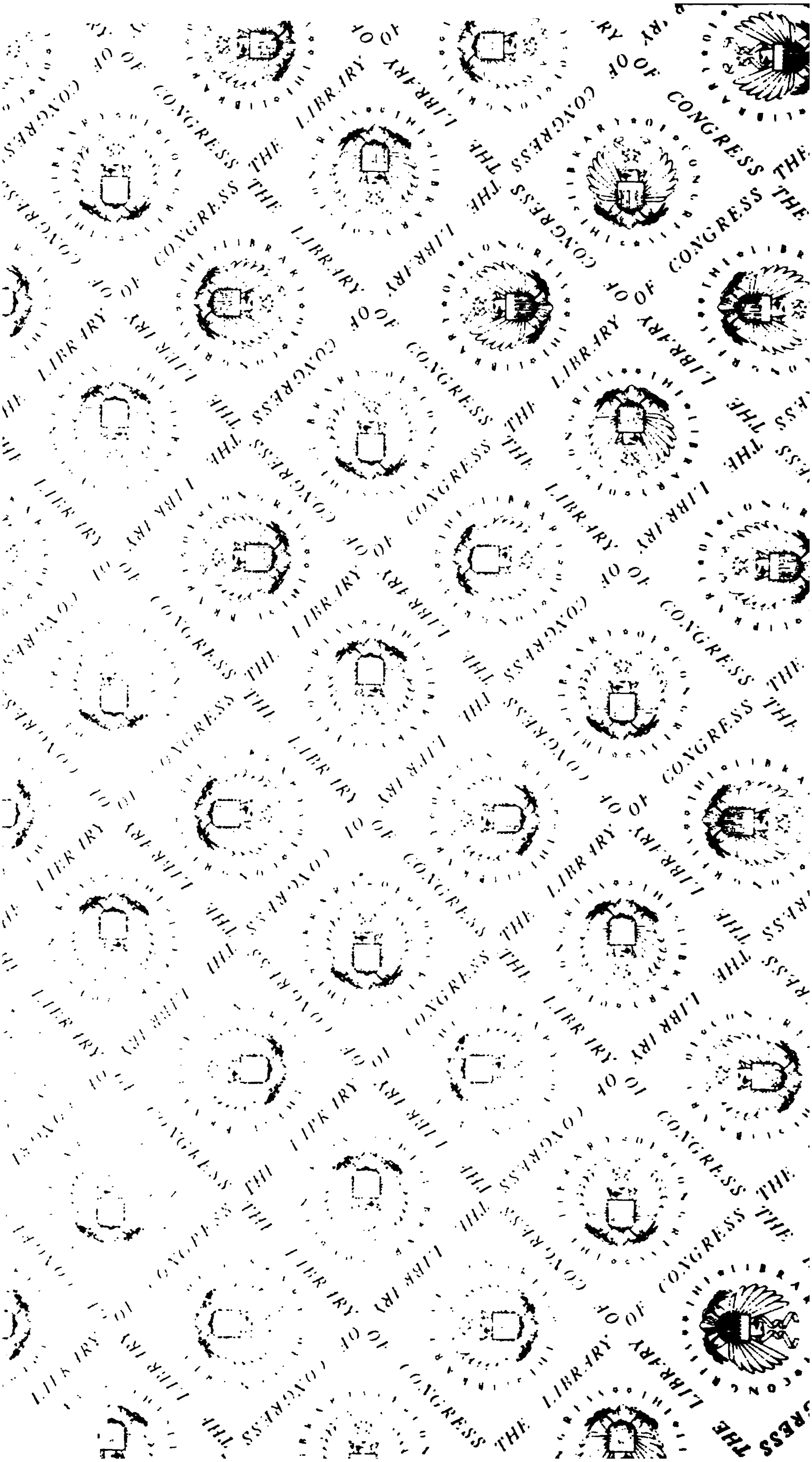

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